2. Investment Opportunities in Rajasthan

Rajasthan offers a set of unique advantages and attractive opportunities for profitable investment to the entrepreneurs. It is rapidly emerging as an attractive and exciting destination for doing business in India. With the seventh largest population in India, Rajasthan possesses a well-educated and talented pool of workforce. People of Rajasthan are also renowned for their entrepreneurial spirit. Indeed, a large number of leading industrialists in India hail from Rajasthan.

Rajasthan has a truly strategic location. It borders five major states of northern and western India that jointly comprises of 350 million people and a GDP of US$ 155 billion during 2009-10[3]. 23 percent of the National Capital Region also lies in Rajasthan. It imparts convenient access to a vast consumer market and provides attractive opportunities for private sector investment to cater to their demands.

Nearly 40% of the proposed Delhi Mumbai Industrial Corridor (DMIC) and 46% of the total Project Influence Area (PIA) falls within Rajasthan. Further, the State is also developing five key nodes for DMIC with manufacturing hubs and logistics parks along with world-class infrastructure and integrated townships. It will facilitate easier access to seaports at Maharashtra and Gujarat, thus, opening up the vast foreign market to Indian industries as well.

Rajasthan is one of the largest mineral producing states of India. It has an abundance of metallic and non-metallic, ferrous and non-ferrous, mineral deposits such as silver, limestone, phosphate fluoride, rock phosphate, copper ore, zinc, gypsum, clay, granite, marble, sandstone, dolomite, calcite, emeralds and garnets limestone, lignite, etc. It has a natural advantage in ceramic related industries. Rajasthan also has huge reserves of mineral oil. There are in all 25 oil fields discovered till date. The three largest amongst them are the Mangala field, Bhagyam field, and the Aishwariya (MBA) field.

The law and order situation in Rajasthan is considered to be one of the best in India. It has a remarkably peaceful industrial climate with minimum labour-industrial discord. As per a report, the no. of person-days lost in factories here is one of the lowest in India. The political situation is also relatively stable in Rajasthan.

3. Investment Policy and Promotion Measures

3.1 Investment Policy in Rajasthan

To boost investment flows into the state, the Government of Rajasthan has announced several investment policies from time to time. The prime objective of these policies is to accelerate the overall pace of industrial growth, generate employment and make Rajasthan the most preferred investment destination. They also lay special emphasis on strengthening the small scale, tiny and cottage industry sector in the State, export promotion, quality upgradation and thus

3. www.investrajasthan.com

ensuring overall development of the State.

The last comprehensive industrial investment promotion policy was announced in the state in 1998. This was replaced by Rajasthan Investment Promotion Scheme (RIPS) 2003[4]. These investment promotion schemes are updated every year by the government to make pace with the industrial development needs of the state.

The State Government has also put in place several sector-specific investor-friendly policies and schemes, like the Rajasthan Micro, Small and Medium Enterprises Development Assistance Scheme, the Healthcare Policy, the Hotel Policy, the Power Policy, the Information Technology (IT) and ITES Policy, the Tourism Policy, the Biotech Scheme, and the Policy for Promotion of Agro-Processing and Agri-Business, the SEZ policy, etc. Rajasthan Start-up Policy has also been implemented in 2015 to promote entrepreneurship in the state.

3.2 Investment Promotion Measures

The state government has set up several institutional bodies for simplifying and fructifying investment in the State. It has formed various state and district level committees as well to constantly keep an eye on the pending projects and facilitate their implementation. The key nodal agencies promoting and facilitating industrial development in the State include the Bureau of Investment Promotion (BIP), Rajasthan State Industrial Development and Investment Corporation (RIICO), Rajasthan Financial Corporation (RFC), Project Development Corporation (PDC), and Industrial Advisory Council.

Rajasthan government also provides numerous subsidies, power concessions, land and building tax exemptions, a special land package for specific industries and several other incentives for enabling investment inflows in the state. Investment subsidy and Employment generation subsidy have also been introduced. Moreover, Government has also developed Special Purpose Industrial Complexes, Export Promotion Industrial Parks, Information Technology Parks, etc.

3.3 Special Economic Zone (SEZ) Policy

With the intent of accelerating industrial development, the Government of Rajasthan implemented the SEZ policy in 2003. SEZs have specially delineated duty-free economic zones with a comparatively relaxed and business-friendly policy regime. Apart from the existing three SEZs in the public sector and one mega-SEZ, Mahindra World City, in the joint sector, the state has eight approved SEZs, out of which seven are notified[5].

4. *Rajasthan Industrial and Investment Promotion Policy 2010, Government of Rajasthan*

5. www.investrajasthan.com

3.4 Single Window Clearance Mechanism

To streamline the investment procedures further and ensure time-bound, hassle-free and single point issue of various licenses, approvals and clearances to the projects and investment proposals, the Government of Rajasthan have passed the Rajasthan Enterprises Single Window Enabling and Clearance Act on 27th of Dec 2010[6].

It acts as a one-stop interface between investors and various government departments. It has an online tracking system to monitor the progress of project applications. All the clearances required for industry to be set up, from land acquisition to environmental clearances, are covered by the single window committee. However, it is limited to the setting up and expansion processes and does not support the industry during operations.

In pursuance of making the Single Window System truly effective, the State Government has set up a three-tier clearance mechanism to provide speedy and one-stop clearances for implementation of investment proposals. The decisions of these committees are binding upon all the departments concerned. The empowered committees shall be as follows

S. No.	*Empowered Committee*	*Chairman*	*Nodal Agency*	*Total Outlay of Investment Proposals*
1	Board of Infrastructure Development & Investment State Level	Chief Minister of Rajasthan	Bureau of Investment Promotion (BIP)	More than Rs. 25 crores
2	Empowered Committee	Chief Secretary, Government Rajasthan	Bureau of Investment Promotion (BIP)	Rs. 3 crores to Rs. 25 crores
3	District Empowered Committee	Colloector	District Industries Centre (DIC)	Below Rs. 3 crores

4. Investment Environment in Rajasthan

4.1 Investment Trends in Rajasthan

Despite the above-mentioned advantages that Rajasthan offers and the various policy and other initiatives taken by the state government to promote and facilitate private investment, the rate of industrial progress in Rajasthan remains sluggish. Private investment in Rajasthan stood at less than 6 percent of GSDP in 2002-03as against 15.7 percent nationally[7]. According to the Reserve Bank of India, FDI

6. Investment Climate in Rajasthan (2012), Confederation of Indian Industry
7. India Rajasthan Closing the Development Gap (2006)

inflows from April 2000 to May 2010 amounted to US$ 470 million.

The percentage share of Rajasthan in attracting private investment has been rather modest. The industrial investments coming to Rajasthan in absolute terms were Rs. 7502 crore in 2006 which rose to Rs. 29700 crore in 2010 but diminished to Rs. 5613 in 2016. Though it had shown an increase from 1.26% of total Indian investments in 2006 to 3.21% in 2012, the figure is not very satisfying and portrays a dismal picture of state's investment environment. Rajasthan received just 1.37% of total investments in India in 2016.

4.2 Doing Business in Rajasthan

The challenges of doing business in Rajasthan are well-documented with very low rankings on most of the determinants of investment attractiveness in the World Bank's 2009 report on Doing Business in India, as compared to other Indian states. Jaipur, the capital of Rajasthan, occupied 7th rank out of 17 Indian cities in the ease of doing business. Thus, there is an urgency to focus on the business environment of Rajasthan.

Rajasthan presents a mixed picture as regards key indicators of the business environment. While it performs comparatively well in areas such as starting a business, paying taxes and registering property, Rajasthan performs poorly on other indicators. Moreover, the time taken and costs complied for obtaining clearances is very high in the state.

5. Review of Literature

Confederation of Indian Industry (2016) in 'Investment Climate: A Report on Northern States of India' analyses the importance of the investment climate prevailing in the state on its ability to attract investment. The report presents a detailed description of the various macro issues such as economic and political stability, tax policies, land and labour regulations, other economic policies and governance issues play a vital role in shaping of the investment climate.

FICCI (2012) in its report “Empowering India: Redesigning G2B Relations, Rajasthan” makes use of the primary data to highlight 12 key factors influencing the investment decisions of the entrepreneurs. It benchmarks the best practices across Indian states on the basis of doing business indicators of the World Bank and makes recommendations for improving the business climate in Rajasthan.

6. Constraints to Private Investment in Rajasthan

Despite being a strategically located and resource abundant state and the series of initiatives taken up by the state government to facilitate investors, domestic as well as foreign, Rajasthan remains a difficult state to do business. Entrepreneurs face several obstacles in setting up their business operations in the state. Major constraints amongst them are following:

1) Bureaucratic Constraints

While investment approvals are granted quite readily at the central level, subsequent setting up of business operations require a series of approvals and clearances at the state and local level. Legal and regulatory inefficiencies and red tape exist that restrict the entry, exit and efficient operation of businesses, particularly small and medium firms. An investor faces a large no of bureaucratic hassles in establishing the business project in Rajasthan. They are as follows:

(a) Multiplicity of Approvals

An entrepreneur is required to seek a large no. of clearances from multiple authorities. It unnecessarily delays the execution of the investment project. A list of clearances with respective timeframe for setting up a manufacturing unit in Rajasthan is given:

Concerned Agency/ Department	Permission Required	Timelines
Department of Environment	Site approval/environment clearance	90 days
	No Objection Certificate to establish	45 days
	No Objection Certificate to operate	30 days
	Renewal of consent	30 days
Industrial Commissionerate and State Revenue Department	Letter of intent/industrial license	15 days
	Sponsoring for essential raw materials and inputs	30 days
	Land allotment	30 days at the district level 60 days for state government approval
Bureau of Investment Promotion	Incentives	30 days at the district level 45 days at the state level
Medical and Health Department	Drug License	45 days

Rajasthan State Electricity Board	Release of Power	Load up to 60 HP: 66 days Load from 60 HP-300 KW: 90 days Loads from 300 HP-3000 KW: 180 days Load from 3000 KW-33KV: 375 days
Revenue Department	Land conversion	Up to 20 hectares: 30 days Above 20 hectares: 60 days
	Land allotment	30 days
	Land allotment if government approval is required	60 days
RIICO/RFC	Sanction of loan	60 days
	Allotment of plot in industrial areas	15 days

Source:www.ibef.org

(b) Entry and Exit Regulations

According to World Bank Doing Business in India 2009report, it takes on average about 12 procedures and a month's time to get the approval for starting a business in Rajasthan. However, the cost of starting a business is very high as compared to other states. It costs firms 45.5% of income per capita to start their business. High costs reduce the profitability of operating units and directly influence the location decisions.

Similarly, exit regulations are also very cumbersome in the state. The time taken to go through insolvency is about nine years in Jaipur, compared to about seven years in Bangalore and Hyderabad. This reflects the state's complex bankruptcy laws. The recovery rates are also meager here just 12.2%.

(c) Business Licenses

They form another crucial impediment to investment activities in the state. The government requires more than 100 licenses, and a midsize business needs around 25 licenses to operate in Rajasthan. Moreover, licenses generate significant administrative costs for businesses — around 1 percent of GDP and over 4 percent after including licensing fees and charges[8].

(d) Numerous Inspections

A survey conducted at the all–India level by the Federation of Indian Chambers of Commerce and Industry (FICCI) in 2004 revealed that, on an average, an establishment is subject to 37 inspections a year, with some factories facing 67 inspections in a single year. A maximum number of visits related to the Environment Officer, State Pollution Board officials, and the Labour Officer. Some of the inspectors have wide-ranging powers: 20 of them have powers of imprisonment, 12 for sealing the unit and 21 for stopping operations. The wide powers vested in the inspectors and the frequency of their visits has led to the phenomenon of Inspector Raj and proved to be a fertile ground for breeding corruption.

2) Labour Constraints

Although labour market regulations are a concurrent subject with the union government, state governments have the authority to amend the law. Consequently, there are a plethora of labour laws, around 250 at the central and state levels together. These are opaque and burdensome and usually perceived to be worker protective. Moreover, they are decades old and suffer from severe inflexibilities.

Provisions of the labour laws are generally enforced by the officers of the Central Industrial Relations Machinery (CIRM) at the central level, and through the state enforcement machinery at the state level. However, some of the labour enactments are also enforced by the Employees State Insurance Corporation and Employees Provident Fund Organisation.

Some of the labour laws implemented by the Government of Rajasthan are the Trade Unions Act, 1926; The Employees' State Insurance Act, 1948; The Payment of Wages Act, 1936; the Factories Act, 1948;the Minimum Wages Act, 1948; Rajasthan Shops and Commercial Establishments Act, 1958; Contract Labour (Regulation and Abolition) Act, 1970; etc.

Labour laws impose onerous regulations on employment in registered firms in the state. Firstly, the strict regulation stipulated in Part VB of the Industrial Disputes Act (IDA) 1947 (as amended in 1976) mandates the prior approval of the state government for layoffs, retrenchment or closure of industrial establishments employing more than one hundred workers. This approval is rarely granted. Such laws discourage firms from hiring permanent labour and promoting more capital-

8. Fostering Investment and Business Growth in Rajasthan(2010), World Bank Group

intensive methods instead. Alternatively, it also stalls the expansion of small and informal sector firms.

Another rigid law of Contract labour (Abolition and Regulation) Act (1970) permits contract labour only in 'non-core areas.' It also requires 21 days' notice and the consent of employees to change the nature of their job. Although the use of contract labour has been increasing significantly in Rajasthan as in other states, firms face considerable uncertainty. It curtails labour mobility and reduces the supply of low-cost labour.

Third, labour market-related inspections and prosecutions are markedly higher in Rajasthan compared to states like West Bengal or Tamil Nadu-with about 75 percent of firms or registered firms being inspected. This creates opportunities for harassment, rents, and bribes that can deter investment. This is especially burdensome for exporters who have to compete with producers in other states.

The Department of Factories and Boilers of the state government enforces the provisions of the Factories Act, 1936 to ensure safety and health amongst industrial workers, and promote labour welfare through industrial hygiene in the organized sector. As per estimates available, the department carried out 6,099 inspections of factories and boilers during the year 2004-05 to November 2004.

Cordial labour and industrial relations are also a prerequisite for an enabling investment environment. While there were 1,332 man days lost in 2004 in Rajasthan on account of industrial disputes, it fell to 953 in 2007. Although there has been a continuous improvement over time in the prevailing industrial relations in Rajasthan, it is still quite high in comparison with other states. Labour Department enforces various labour laws and carries out regular inspections for maintaining industrial peace and to ensure welfare of the labourers as well.

Labour Reforms

Rajasthan government has recently introduced several amendments to the labour laws. It has brought changes to the Industrial Disputes Act 1947allowing firms in Rajasthan to lay off up to 300 workers without government permission. The Contract Labour Act 1970, the Factories Act 1948 and Apprenticeship Act-1961 have also been amended to enhance the ease of doing business, encourage industrial activity and generate jobs.

3) Land Acquisition Constraints

Land acquisition and registration is another chronic obstacle to investment in Rajasthan. RIICO is the nodal agency for acquisition and development of land for industrial purposes. It helps industries acquire land in 4 situations:

(i) Allotment from existing land banks

(ii) Allotment of land in Industrial Parks

(iii) Acquisition of government land

(iv) Acquisition of private land

Land prices are determined on the basis of District Land Committee (DLC) rates which are regularly updated to reflect the actual market values. Landowners are adequately compensated by offering them 20-30% higher prices from the DLC rates. As an alternate form of compensation, landowners may opt to retain 25% of their original land to take advantage of future price appreciation after the development in the region[9].

The existing regulations of land acquisition in Rajasthan are very long drawn and cumbersome. The complete process starting from identification of land to acquisition can take nearly 18 months to 2 years. Being a desert state, availability of agricultural land is limited in Rajasthan. So, land conversion from agricultural to industrial purposes may raise public protests. Consequently, the government is very selective in the approach. To resolve this problem, provision has been made for automatic conversion of land in rural areas up to 5 hectares. Land conversion in Rajasthan is done through RIICO or the Bureau of Investment Promotion (BIP), and even though the Single window clearance mechanism.

Furthermore, a defined and transparent land allotment procedure is also not available presently. Demands are met on a first-come-first-served basis, with limited clarity on the allotment mechanism.

Even though the digitization of records has been started in 2011 and all new property transactions are now computerized, but it is restricted to only four districts of Rajasthan. As a result, there is an insufficient presence of computerized land records currently. Moreover, registration and mutation procedures are also not integrated with registration of documents being carried out at the Stamps and Registration department while mutation of title at the Revenue Department. It creates unnecessary hassles for the investors.

The government of Rajasthan needs to simplify and speed up the land conversion and registration procedures. Establishment of investment zones, upgradation of the land banks and formulation of new policy guidelines to leverage land for investment may be carried out.

4) Inadequate Infrastructure

The status of physical infrastructure is one of the most crucial components which influence investment considerations. Coordination of policy decisions of the centre, states, and local bodies is essential. Rajasthan has a relatively poor quality of infrastructure, particularly power and transport. Although the situation has improved recently, the private sector has long suffered from unreliable power supply. Poor connectivity to ports by the landlocked state imposes a serious

9. India Rajasthan Closing the Development Gap (2006), World Bank

constraint on competitiveness in manufacturing. Rajasthan's poor road infrastructure and inadequate rail connectivity result in higher delivery time for exporters.

Inland container depot facilities in Rajasthan are severely stretched, resulting in an unduly long waiting time for clearing finished goods. This problem is further exacerbated by congestion in the ports to which industry in Rajasthan has access (Nava Sheva, Pipavav, and Mundra). This is largely due to increased container traffic from Rajasthan.

The state's acute water problem also implies that firms often have to source their water from private tankers. This has significant cost implications for firms in sectors (such as textiles) where water is a key input; or in tourism (where drought affects the biodiversity of Rajasthan's eco-reserves).

7. Conclusion

The role of private investment has acquired special significance in the wake of economic reforms initiated in 1991.States compete fiercely to attract huge sum of private investment by introducing several concessions and incentives. In recent years, the Government of Rajasthan has also introduced several measures to improve the investment climate and materialize its immense investment potential.

Despite recent efforts, the state's entrepreneurial potential has not yet been adequately leveraged, and the state has remained an underdeveloped region. It still remains a difficult state to do business. The share of Rajasthan in total investment inflows in India has remained dismal.

There is an urgent need for the government to revisit the state's private sector and industrial development policies and emphasize on creating a better climate for private investment. Rajasthan needs to cut down on lengthy procedures and ensure proper infrastructure facilities. It should focus on removing legal and regulatory barriers to business and enhancing access to finance for firms. Effective action should be taken to re-engineer the entire gamut of business regulatory processes and strengthening the supportive institutional framework.

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Appendix

Table1.1: List of SEZs in Rajasthan

Type	Numbers
SEZs (notified and operational)	3
SEZs notified	7
SEZs formally approved	1
SEZs approved in-principle	12
Total	23

Source: Official website of RIICO

Table1.2: Investment Intentions in terms of IEMs Filed, LOIs/DILs Issued

Year	*Proposed Investment in Rajasthan (in Rs. Crore)*	*Proposed Investment in India (in Rs. Crore)*	*Share of Rajasthan in India (In %)*
2006	7502	593380	1.26
2007	13863	834249	1.66
2008	21899	1523852	1.44
2009	13461	1040259	1.29
2010	29700	1736322	1.71
2011	23488	1539728	1.53
2012	18218	567868	3.21
2013	36952	530086	6.97
2014	7335	405027	1.81
2015	6894	311031	2.22
2016	5613	414086	1.37

Source: SIA Statistics, Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India

Table 1.3: Ranking of Indian States on World Bank's Doing Business Indicators

Indicator	*Jaipur Rajasthan*	*Ludhiana Punjab*	*Ahmedabad Gujrat*	*Bengaluru Karnataka*	*Hyderabad Andhra Pradesh*
1. Ease of Doing Business	7	1	5	13	2
2. Starting a Business	3	7	14	17	4
3. Dealing with Construction Permits	13	7	4	1	4
4. Registering Property	3	11	2	4	9
5. Paying Taxes	2	1	11	12	13
6. Trading Across Borders	14	12	3	9	13
7. Enforcing Contracts	7	4	16	15	1
8. Resolving Insolvency	14	2	4	8	1

Source: Doing Business in India 2009 Report, World Bank, IFC

Estimating Tax Buoyancy for Rajasthan: An Empirical Analysis of VAT

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Abstract

A large increase in fiscal imbalance resulting from the rapid expansion in expenditure and low revenue collection has remained a public outcry. However, revenue mobilization occupies a vital role in fiscal policy framework in developing states like Rajasthan; tax revenue is among the major sources through which it can be achieved. Objectives of the paper is to analyze performance of taxes imposed by state (own taxes) in terms of tax to GSDP ratio, examine tax stability and to estimate buoyancy for own tax and non-tax revenue. The effects of fiscal reforms in the state are also captured by bifurcating the time period into pre and post VAT (Value Added Tax) period. Data is congregated from various reports of Department of Economics and Statistics Rajasthan (DES), Budget Studies and Statistical Abstracts of various years. Ordinary Least Square (OLS) regression exercise is carried out during the period of 1991-2015. The analysis concludes that state's own and non-tax performance has improved after the introduction of VAT and majority of tax heads have proved to be buoyant. Results also comprehends that revenue from own tax revenue contribute to overall revenue stability. Therefore, a well designed tax system is needed to encourage not only the competitive growth across various sectors but also to stimulate economy on high growth trajectory.

1. Introduction

Problems of taxation have been receiving special and increasing attention over the years. A large increase in fiscal imbalance resulting from the rapid expansion in expenditure and low revenue collection has remained a public outcry. Moreover, skyrocketed fiscal deficit has given the urge to fierce and immediate action to avoid loss of market confidence, restore debt sustainability and rebuild fiscal buffers (Belinga et al. 2014). Further, the ageing of the population will also put pressure on public finances and risk an unsustainable debt trajectory in the longer terms. Since taxation is the major source of financing the expenditure, various tax reforms have been undertaken to create a sustainable tax system that would generate adequate revenues. Various studies (Omondi et al. 2014; Gayathri, 2013; Kulshrestha et al. 2015) have confirmed the positive impact of tax reforms on the overall tax structure. Revenue mobilization occupies a vital role in fiscal policy implementation especially in developing states where there is a crunch of public funds for public expenditure. A varied number of factors cause changes in tax revenue such as changes in the tax base, changes in income,

changes in the efficiency of tax assessment and collection, etc. Over the years, the tax system has undergone a transformation at the global level. In developing countries, fiscal imbalance remained the driving force for the reforms. According to Rao & Rao (2013), Indian tax reforms are largely based on the domestic requirements and demands, unlike other developing countries where tax reforms are guided by multilateral agencies. In India, overlapping tax system is the major obstacle that hampers the efficiency of tax collection. Tax buoyancy helps in identifying weakness in the tax structure and improves the outturn on the fiscal accounts given the prevailing macroeconomic conditions (Wellington, et al. 2015). Dholakia & Dholakia (2000) also concluded that the tax revenues of a state economy remain sensitive to the macroeconomic performance of the state measured in terms of inflation and the growth of real income.

There is a consensus in the literature that improvement in tax revenues is necessary to bring forth the effectiveness of government efforts (Faroor, 2006; Rajaraman et al. 2006). Analysis of Buoyancy rate is a means for evaluating the effectiveness of policies for improvement in tax revenue. Belinga et al. (2014) in their study calculated short and long-run tax buoyancy in OECD countries between 1965 and 2012, found that tax systems have generally become better automatic stabilizers.Countries have continuously embarked reforms in taxation with the objective to increase the tax base and to enhance tax efficiency. According to Schumpeter (1918) development of the tax system is intrinsically intertwined with the nature of the state and its history. Based on the structural approach in the work of Tanzi (1987, 1992) and Burgess & Stern (1993), it can be inferred that changes in tax system reflect the structural change of the state. Barro and Martin (1995) concluded that a well-defined tax system can minimize the efficiency losses imposed by taxes and even raise the growth rate in endogenous-growth models. Tax buoyancy, tax efforts, tax sustainability and tax capacity are few measures to depict the taxation performance of a country or a state. Studies of Lotz and Raja (1971), and Gupta (2007) used OLS techniques to find the determinants of total tax to GSDP ratio and tax potential of developing countries. Ahmed and Mohammed (2010) also made an attempt to find the determinants of tax buoyancy of developing countries using cross-sectional data from 25 developing countries. Upender (2007) found that the estimate of tax buoyancy remained less than unity during the post-tax reform period, showing the inelastic nature of gross tax similar results were obtained from the study of Samwel and Issac (2012) reflecting the less buoyant and inelastic nature of Kenya's tax system. Thus, the literature has shown that developing countries face comparatively more challenges in imposing a tax and optimally collecting tax revenue than that of developed countries.

There are a limited amount of resources in Rajasthan that can be obtained from domestic sources and from abroad. The state has to shoulder the responsibility of

welfare state accommodating with its problem of the high fiscal deficit; this has pushed the government to pursue tax reforms in order to increase its tax revenue. Against this background, the study tries to analyze State's own tax performance in terms of tax to GSDP ratio; whether it has been considerably good or not. An attempt has also been made to statistically estimate the responsiveness of tax revenue to the GSDP by calculating tax buoyancy. The effects of fiscal reforms in the state are also captured by bifurcating the time period into 1991 to 2003 and 2004 to 2015 pertaining to the pre and post VAT period. Further, tax stability is also calculated to identify the taxes which lead to more or less stability in overall tax revenue.

2. Hypothesis

In order to fulfill the objectives of the study following hypothesis have been framed out.

1: There is a significant change in state's own tax performance over the years
2: Introduction of VAT has made Own Tax revenue of Rajasthan more buoyant and stable
3: Introduction of VAT has made Non-Tax revenue of Rajasthan more buoyant and stable

3. Methodology and Data Sources

The study is based on secondary data ranging from 1991 to 2015, congregated from various reports of Directorate of Economics and Statistics (DES), Budget Studies and Statistical Abstracts of various years of Rajasthan. The given duration is further categorized into two time periods, one is pre VAT period (1991-2003) and another is post VAT period (2004-2015). In order to assess the potential power of a revenue source to generate additional revenue, the concept of tax buoyancy is used. It is a measure of the responsiveness of tax receipts to economic growth which reflects the progressiveness of the tax structure and administrative efficiency. Tax (Revenue) Buoyancy is defined as:-

Buoyancy = %? Revenue / %? Base

The own tax and non-tax revenue from different sources and base (GSDP) are taken in real terms to avoid biased results that could have resulted from inflation. Time series data for GSDP is converted from their nominal values to their real values by dividing nominal values with the GSDP deflator. Similarly, Tax revenues are converted to their real values by dividing their nominal values with the GSDP deflator. The buoyancy coefficient is calculated by using the revenue exponential regression (lin-log) model: -

$Yi=\beta_1 X_i^{\beta 2} e^{ui}$ (Equation 1)

The Equation (1) can be expressed alternatively as (double log function is derived),

$$\text{Log } Y_i = \text{Log } \beta_1 + \beta_2 \text{ Log } X_i + u_i \quad \text{(Equation 2)}$$

Where, Yi = real revenue from OTR (Own Tax Revenue) and NTR (Non-tax revenue) sources, X_i = GDP at current prices, β_2 = parameter, ui = error term

The Equation (2) can also be written as,

$$\text{Log } Y_i = \alpha + \beta_2 \text{ Log } X_i + u_i \quad \text{(Equation 3)}$$

Where, α = Log β_1 (the intercept), β_2 = buoyancy coefficient. The buoyancy coefficient (β_2) measures the elasticity of real GDP (X) with respect to real revenue from OTR & NTR resources (Y), that is the percentage change in Y for a given percentage change in X. The revenue sources are regressed with respect to GSDP except for electricity duty and tax on motor vehicles, their tax bases have been electricity consumption (million kWt units) and a number of registered motor vehicles respectively.

Interpretation: If buoyancy is greater than 1, i.e. $\beta 2 > 1$ then the effort of an own and non-tax source is regarded as good. It means that the percentage increase in the revenue from a source is higher than the percentage increase in real GSDP during the study period. It shows that there is the greater mobilization of revenue by their resources of OTR and NTR sources. If buoyancy is less than 1, i.e. $\beta 2 < 1$ then the effort is regarded as weak, means that the percentage increase in the revenue from a source is less than the percentage increase in real GSDP (Jenkin et al. 2000). It creates difficulty for the government to mobilize more OTR and NTR by their resources.

Further, Tax Stability is calculated by computing coefficient of variation which is helpful to identify whether revenue from a given tax leads to more, or less, stability in overall stream of revenue. A lower C.V. implies greater stability (Haughton, 1988).

4. Limitations

Due to unavailability of data on electricity consumption for the duration of 2012-15 the buoyancy of electricity duty is computed only till the duration of 2012. Also due to meager share of tax on goods and passengers in own tax revenue of state its computation has been withdrawn from this paper.

5. Structure of Tax System in Rajasthan

Revenue sources of the state can be broadly classified into two categories, first one is tax revenue which includes own tax revenue and share in central taxes, and second is non-tax revenue, which encompasses non-tax revenue of the state and

grants-in-aid transferred from the central government. Over the period of time, the state has been pursuing tax reforms in order to design a viable system that helps to sustain government expenditure. As per the study by Rao & Rao (2006) like other states, tax structure of Rajasthan is rigid and bounded by several obstacles related to tax collection. State level tax reforms have focused more on revenue generation rather than on structured and simplified taxation system. Own tax revenue can further be classified into seven major taxes levied by the state those are, stamps & Registration Fees, State excise duty, sales tax, tax on vehicles, electricity duty, tax on goods and passengers and land revenue. The contribution of these components of own-tax revenue has remained similar throughout the study duration.

The composition of own and non-tax revenue during 2015-16 is shown in the graph 1. Sales tax and state excise duty have the highest share in state's tax revenue followed by stamps and registration fee while Tax on goods and passengers has a meager share of nearly one per cent. Non-Tax sources are broadly classified into four categories: general services, economic services, social services, and interest receipts, dividends & profits. Performance of non-tax revenue in Rajasthan has not been satisfactory as their percentage share in 1991 was 16 per cent which declined to 10 per cent in 2015-16. Among the bifurcated categories, the share of economic services has increased during the reference period. Its contribution increased by manifolds from 43per cent in 2009 to more than 60 per cent in 2010 and from there on it has remained highest followed by interest receipts, dividends & profits and general services. Role of social services in revenue generation has remained least throughout the study period. CAGR of Tax revenue (15%) has remained higher than the CAGR of GSDP growth (13.3%) (Refer table 2). CAGR of tax revenue in the pre VAT period remained higher (13.2%) than the GSDP (11.8%) on the other hand; CAGR of GSDP was larger than tax revenue in the latter period at 17.6 per cent and 16.6 per cent respectively. Tax revenue growth has remained larger than the GSDP growth in pre VAT period, then after VAT, GSDP grew faster than the tax revenue.

The tax to GSDP ratio is an economic measurement that compares the amount of taxes collected by a government to the amount of income received by a nation. As taxes are linked to economic activity, a consistent ratio is a positive indicator for development. Traditionally it has been used to measure the tax performance of various countries and it has been found that developing nations possess lower tax ratios as compared to developed ones.

Minimal variability in tax to GSDP ratio (in Graph 2) ranging from seven to eleven per cent indicates consistency in tax performance of the state, during the study period. The own tax revenue has the major composition in total taxes followed by transfers from central taxes, non-tax revenue, and grants-in-aid. Its share in revenue resources has increased from nearly 37 per cent in 1991 to 42 per

cent in 2015. Own Tax to GSDP ratio is more stable than the total tax to GSDP ratio of the state. The maximum tax ratio (own tax to GSDP) experienced by Rajasthan is 6.9 per cent in 2006 and the lowest is 4.7 per cent in 1997. Graph 2 shows that own tax-GSDP ratio of the state has increased over the years, that is, a collection of tax has increased over the years with the increase in income, ensuring consistency in tax revenue performance. Slight fluctuations are found in the own tax to GSDP ratio during pre VAT period, on the other hand, the ratio has increased to nearly 6 per cent and remained proportionately stable in Post VAT period.

6. Trends, Buoyancy and Stability Computations

6.1 Own Tax Revenue

Own Tax Revenue of the state has increased from Rs.1549 crore in 1991 to Rs.42712 crore in 2015 and recorded a growth of 14.9 per cent. The growth before the introduction of VAT was 13.9 per cent which increased to 16.45 per cent in the post VAT period. It is clearly reflected from the table 2 that reforms have led to a positive change in terms of generation of tax revenue.

The regression results of table 1 illustrate that the estimate of tax buoyancy is positively significant and has increased from 1.14 to 2.11 during post VAT period showcasing the responsiveness of own tax revenue to the change in tax base (GSDP). Further, it can be comprehended that tax buoyancy exceeding one would increase tax revenue by more than tax base and potentially lead to reductions in the fiscal deficit. Stability is one of the fundamentals for policymakers, to design and implement a good tax system. A negligible change in coefficient of variation (C.V) supports the stability underlying in revenue generation from own tax revenue.

6.2 Stamps and Registration Fees

Over the period of 25 years, the revenue from stamps and registration fees has increased from Rs.83 crore in 1991 to 3234 crore in 2015. The compound growth registered in post VAT period is 14 per cent which has declined by one per cent from the growth registered in1991-2003 (15.34 %). Its share in own-tax revenue was 6.9% in 1991 which increased to 8.2 per cent in 2015. In terms of buoyancy and stability, after the introduction of the VAT, buoyancy has reduced from 1.2 to 0.55, which is a cause of concern and further reforms need to be made to accentuate its responsiveness to the GSDP. Minimal change in C.V reflects that even though the response to the introduction of VAT was not as desired, yet there is stability in revenue from stamps and registration fees.

6.3 Sales Tax

Sales tax contributes maximum share in total own tax revenue. In 1991 revenue from sales tax was Rs.824 crore which jumped to Rs.26344 crore in 2015,

reflecting an increment in compound annual growth from 14 to 18 per cent. Its share also increased from 53 per cent to 62 per cent in the post VAT period. From the table 1, it is evident that there has been a marginal change in buoyancy and a minimal change in coefficient of variation reflects the stability in revenue from sales tax. In sum, the analysis reveals that it has potential to increase revenue resources of the state to a great extent.

6.4 State Excise Duty

Revenue from state excise duty has increased but its share has decreased from 23 per cent in 1991 to 15 per cent in 2015. The growth and buoyancy have decreased after introduction of the VAT, and a rise in the value of the coefficient of variation shows the relative instability in the latter period. Increase in transparency and simplification of tax procedure will be helpful to have state excise duty more buoyant and stable.

6.5 Taxes on Vehicles

Revenue from taxes on motor vehicles have increased from Rs.107 crore to 3199 crore, and the compound growth has marginally declined from 15.6 per cent to 13.6 per cent from 1991-2003 to 2004-15. For buoyancy estimates, tax on vehicles is taken as a function of a number of registered motor vehicles. The estimate of tax buoyancy, which was just above the unity during pre VAT period, is less than unity (0.09) during post VAT period evincing the relatively inelastic nature of the given tax. Although post VAT period has found to be more stable recording a C.V. of 46 per cent. Thus motor vehicle tax requires the extensive and mechanical structure of tax collection that ensures transparency and higher tax potential.

6.6 Electricity Duty

To estimate buoyancy of electricity duty, electricity consumption is taken as a tax base and due to unavailability of data on electricity consumption, the post VAT buoyancy and stability is calculated only for the duration of 2012. The revenue has increased from Rs.53 crore in 1991 to Rs.1921 crore in 2015, and on the other hand, growth reduced from 17 per cent to 14 per cent during the period of 1991-2003 and 2004-15 respectively. Estimates of buoyancy declined from 0.933 to 0.21 in the latter period, reflecting that a one percent increase in income leads to increase the tax revenue by less than one per cent, holding ceteris paribus. The stability in this stream has increased with VAT reforms, which shows that there is scope to increase revenue from it with the consistent and prudential efforts of government.

6.7 Land Revenue

Land revenue in 1991 was Rs.36 crore which increased to Rs.1921 crore and during the two reference period, the growth rate of revenue from land jumped from 7.6 per cent to 14.3 per cent in 2004-15. The table shows that VAT reforms

have not made any significant changes in buoyancy estimates as it remained around 0.58. In this case, post VAT period has found to be less stable having a C.V. of 45 per cent.

6.8 Non-Tax Revenue

Compared to own tax revenue the share of non-tax revenue has been unsatisfactorily low, in absolute terms revenue increased from Rs.732 crore in 1991 to Rs.10927 crore in 2015 but the share has decreased from 17 per cent to 10 per cent in the given duration. Introduction of VAT has even impacted the revenue generated from non-tax sources, as its buoyancy increased from 0.43 to 1.21 and growth spurted from 5.43 per cent to 19.14 per cent (Refer Table 2). Non-tax revenue source is found to have greater stability in pre VAT period with C.V. of 27.71 per cent. A very high instability is seen in post VAT period which is attributed to mainly unstable economic services followed by social services (Refers table 1).

Over the years share of economic services has increased and the share of general services has declined while the share of rest of the services fluctuated. Highest growth is seen in economic services followed by general and social services and a stagnant growth is observed in interest receipts, dividends and profits during the post VAT period (table 2). Viewing the buoyancy estimates, the buoyancy of economic services has significantly increased, on the other hand, estimates of general services are found to be insignificant. In case of social services, buoyancy fell to 1.09 to 0.71 and a negative and insignificant buoyancy estimate is found in post VAT period in interest receipts, dividends& profits. The stability of non-tax sources was disturbed mainly by economic services and social services, the stability of general services increased in the given duration and interest receipts remained most stable among these streams.

Thus it is quite evident from the table 1 that revenue from stamps and registration fees has led to more stability in overall tax revenue of the state followed by a tax on vehicles, electricity duty and sales tax. On the other hand, state excise duty has decreased the overall stability of tax structure. In totality, it can also be said that revenue from own tax revenue contributes to overall revenue stability because its own revenue stream is relatively stable in comparison to non-tax revenue stream.

7. Conclusion

It is evident from the analysis that introduction of VAT has positively affected the performance of the tax system of Rajasthan. Results comprehend that there is the statistically significant difference in own and non-tax revenue performance during the post VAT period. Own tax revenue has reported a buoyancy statistics of more than one and remained significant as indicated by t-test showing the very responsiveness of taxes to changes in income. Own tax revenues display greater stability than the non-tax revenues and are accounting the dominant source of

revenue collection.Average Propensity to tax (APT) ratio of OTR to GSDP is increasing with the increase in GSDP during the entire period, but this ratio is increasing with faster rate after VAT period. Gross tax is also elastic, as reflected by increasing APT. Individual tax heads regression results accord more buoyancy and stability in tax structure except for a few streams whose buoyancy and stability has decreased in the given duration, but in sum, buoyancy estimates have reflected the dynamic change in tax performance of the state. With some exceptions, many of the buoyancy estimates approximate to unity. A closer scrutiny of taxes reveals that states own and non-tax performance has improved after the introduction of VAT and majority of tax heads have proved to be buoyant. Thus, the states reform initiatives have yielded positive results translated into a buoyant tax system i.e. that budgetary changes have increased the responsiveness of tax revenues to income.

A well-designed tax system is needed to encourage not only the competitive growth across various sectors but also to stimulate the higher economic growth of the economy. Higher coefficients obtained through Buoyancy analysis focus on the role of discretionary measures in maintaining a steady source of tax revenue (Timsina, 2007). Buoyancy estimates exceeding from one shows that GSDP has helped to improve structural fiscal deficit ratios. Thus it can be stated that taxation system of Rajasthan is fairly elastic but not efficient enough due to the presence of juxtaposition of many tax collection procedures which not only make a few tax streams less tax buoyant and stable compared to other taxes but also leads to higher fiscal imbalance. In a fast-changing economic landscape, a stable tax system having higher buoyancy estimates is the need of an hour.Tax reform measures are mainly undertaken in order to restore buoyancy to revenue, strengthen modern taxes and drastically reduce the complexity and lack of transparency in the system. Therefore, taxation plays an important instrument to attain a proper pattern of resource allocation, income distribution, and economic stability.

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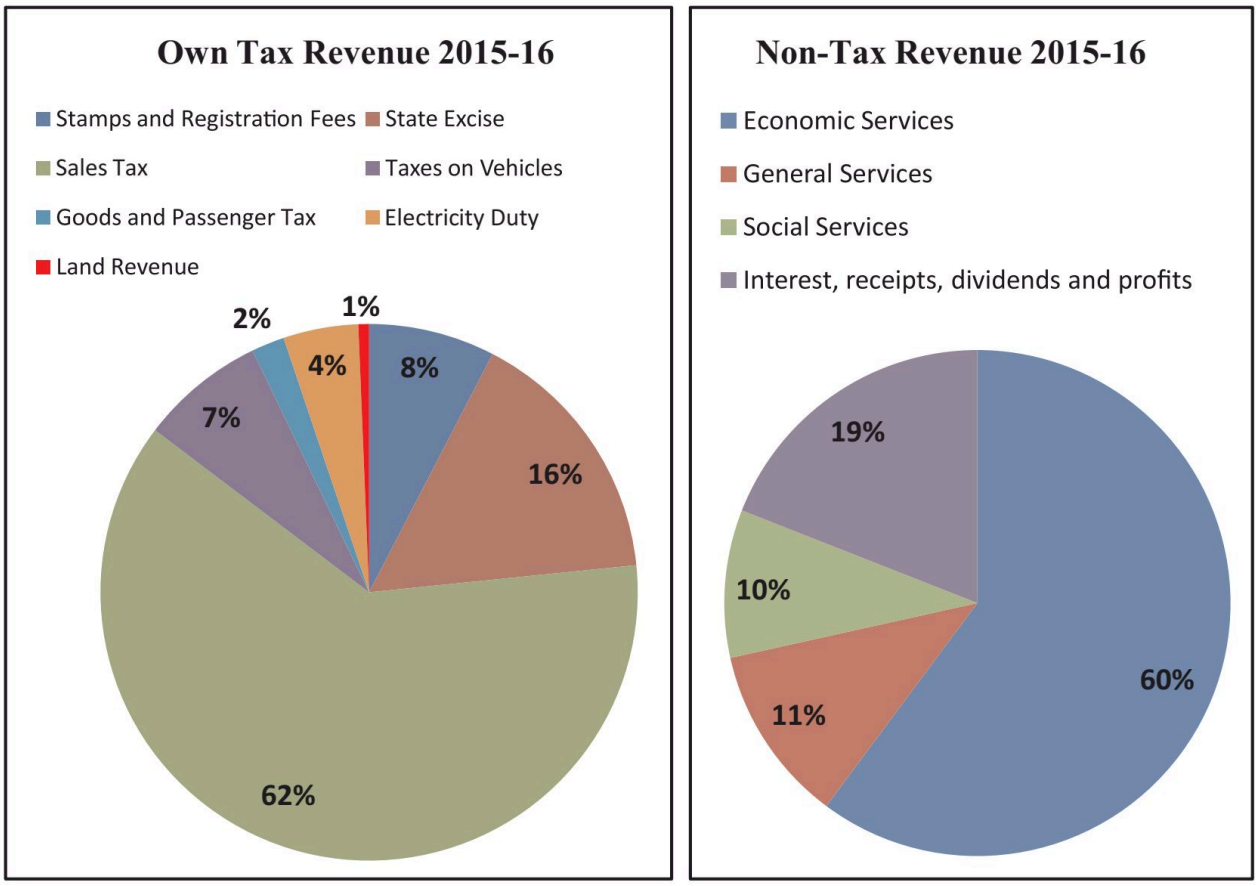
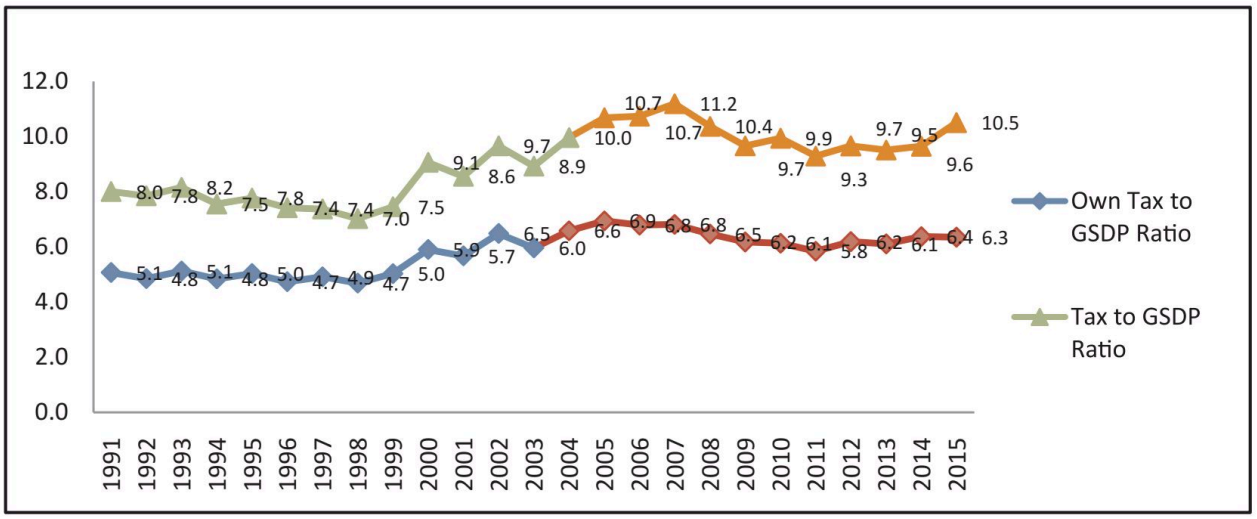
Appendix

Graph 1: Composition of Tax and Non –Tax Revenue of Rajasthan



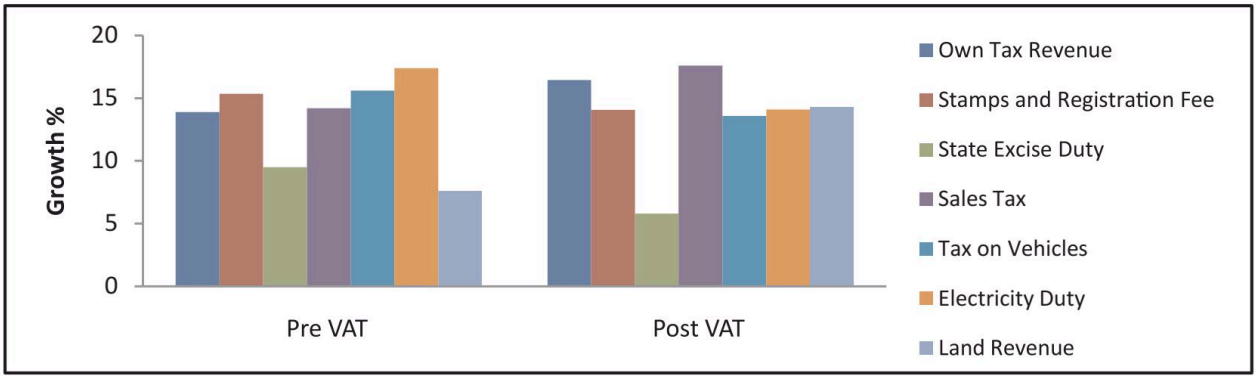
Source: Computed

Graph 2: Tax to GSDP Ratio of Rajasthan



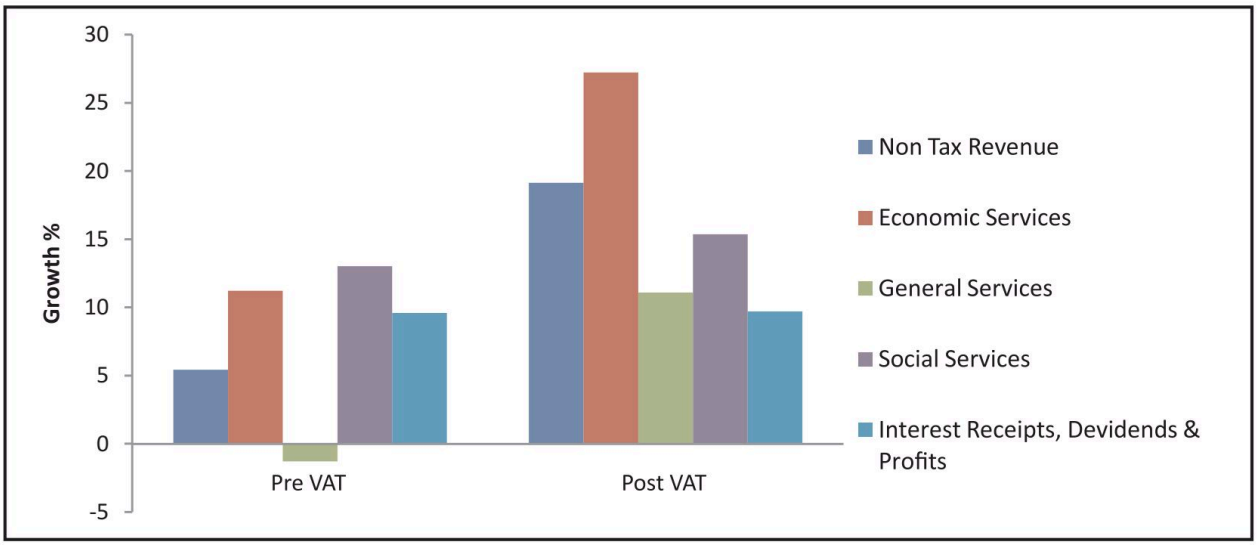
Source: Calculated from data obtained from Budget Study 1991

Graph 3: CAGR of Own Tax Revenue and its Components



Source: Computed

Graph 4: CAGR of Non-Tax Revenue and Its Components



Source: Computed

Table 1: Buoyancy and Stability Results of Own & Non-tax Revenue Sources

Revenue Sources	Buoyancy	t-Test	P-Value	R Square	Coefficient of Variation
Own Tax Revenue					
Pre VAT	1.148	17.92	0	0.97	0.48
Post VAT	2.117	29.22	0	0.98	0.53
Stamps and Registration Fees					
Pre VAT	1.289	23.54	0	0.98	0.50
Post VAT	0.554	3.58	0.005	0.56	0.46
State Excise Duty					
Pre VAT	0.923	16.83	0	0.96	0.36
Post VAT	0.832	7.24	0	0.84	0.56
Sales Tax					
Pre VAT	1.167	14.52	0	0.95	0.50
Post VAT	0.996	26.38	0	0.98	0.55
Tax on Vehicles					
Pre VAT	1.35	21.25	0	0.97	0.57
Post VAT	0.096	3.11	0	0.49	0.46
Land Revenue					
Pre VAT	0.564	3.21	0.008	0.48	0.38
Post VAT	0.588	2.74	0.021	0.42	0.45
Electricity Duty					
Pre VAT	0.933	21.49	0	0.97	0.64
Post VAT	0.21	5.96	0.001	0.85	0.52
Non Tax Revenue					
Pre VAT	0.43	2.71	0	0.4	0.28
Post VAT	1.206	6.71	0	0.82	0.60
Economic Services					
Pre VAT	0.93	20.29	0	0.97	0.39
Post VAT	2.209	7.23	0	0.84	0.78
General Services					
Pre VAT	-0.201	-0.44	0.67	0.017	0.88
Post VAT	0.127	0.29	0.778	0.008	0.40
Social Services					
Pre VAT	1.09	17.91	0	0.97	0.44
Post VAT	0.71	6.31	0	0.79	0.52
Interest Receipts, Dividends, and Profits					
Pre VAT	0.893	3.95	0.002	0.59	0.31
Post VAT	-0.047	-0.45	0.66	0.02	0.34

Source: Computed using data from Department of Economics and Statistics, Rajasthan

Table 2: Compound Growth of Revenue Sources

Revenue Sources	CAGR	t-Test	P-Value	R Square
Own Tax Revenue				
Pre VAT	13.9	48.44	3.56E-14	0.99
Post VAT	16.45	41.58	1.55E-12	0.99
Aggregate	14.9	88.67	1.16E-30	0.99
Stamps and Registration Fee				
Pre VAT	15.34	20.96	3.21E-10	0.97
Post VAT	14.08	10.18	1.34E-06	0.91
State Excise Duty				
Pre VAT	9.5	9.82	9.00E-07	0.89
Post VAT	5.8	8.19	1.00E-05	0.87
Sales Tax				
Pre VAT	14.2	91.11	3.00E-17	0.99
Post VAT	17.6	45.5	6.00E-13	0.99
Tax on Vehicles				
Pre VAT	15.6	33.34	2.00E-12	0.99
Post VAT	13.6	35.63	7.00E-12	0.91
Electricity Duty				
Pre VAT	17.4	11.00	3.00E-07	0.92
Post VAT	14.1	10.12	1.00E-06	0.91
Land Revenue				
Pre VAT	7.6	4.63	7.00E-04	0.66
Post VAT	14.3	8.64	6.00E-06	0.88
Non Tax Revenue				
Pre VAT	5.43	3.24	0.007	0.49
Post VAT	19.14	11.27	5.26E-07	0.93
Aggregate	11.99	13.53	1.94E-12	0.88
Economic Services				
Pre VAT	11.21	21.9	2.00E-10	0.98
Post VAT	27.23	9.54	2.00E-06	0.90
General Services				
Pre VAT	-1.29	-0.282	0.78	0.0072
Post VAT	11.08	3.89	0.003	0.6
Social Services				
Pre VAT	13.01	16.39	4.00E-09	0.96
Post VAT	15.36	18.24	5.00E-09	0.97
Interest Receipts, Dividends & Profits				
Pre VAT	9.6	3.56	0.0045	0.53
Post VAT	9.7	10.77	8.00E-07	0.92
Tax Revenue				
Pre VAT	13.20	49.01	3.13E-14	0.99
Post VAT	16.65	39.57	2.53E-12	0.99
Aggregate	15	72.98	1E-28	0.99
GSDP Current Price				
Pre VAT	11.78	15.03	1.11E-08	0.95
Post VAT	17.56	31.34	2.56E-11	0.98
Aggregate	13.34	35.08	1.78E-21	0.98

Source: Computed using data from Department of Economics and Statistics, Rajasthan

Unemployment – Inflation Tradeoff: Extended Philips Curve for the Indian Economy

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Abstract

Unemployment and Inflation have been a major macroeconomic problem facing all the countries of the world. It has always been a challenging issue in front of policy makers to choose a certain combination of unemployment-inflation rate. The purpose of this paper is to revisit the tradeoff between inflation and unemployment or output using extended Philips curve for the various decadal periods. Extended Philips curve implies the role of expectation using adaptive expectations based on the experience of past five years, supply shocks, the sensitivity of inflation rate to the speed of recovery (growth) and cost of unemployment. The present study finds tradeoff during the period 1955-70, 1980-1992 and 2006-07 to 2014-15 while for the period 1970-80, 1992-2005 negative sign indicates no tradeoff between unemployment and inflation. Turning towards the long run period from 1955-2015 very low and insignificant positive coefficient (.004) suggest a marginal tradeoff between unemployment and inflation for the Indian Economy.

Key Words: Philips curve, Unemployment-Inflation tradeoff, Adaptive Expectation

1. Introduction

Unemployment and Inflation have been a major macroeconomic problem facing all the countries of the world. Over decades, it has remained hot debate among economists that whether it is possible to achieve two main macroeconomic goals, low inflation, and low unemployment, in particular economy at the same time? It's remained one of a challenge for developing countries to sustain low inflation at the low unemployment rate. The trade-off between rate of Unemployment and rate of inflation can be examined by Philips curve. The concept of Phillips curve emerged after named A .W. Phillips who is the pioneer of the Phillips curve in the UK. This curve suggests negative the relationship between the rate of inflation and unemployment. There is three assumptions of Phillips curve; the first one is, in short run, there is a tradeoff between inflation and unemployment. Second, aggregate supply shock can break the concept of Phillips curve because it can cause both higher rate of inflation and high unemployment which is also known as stagflation. Third, in long run, there is no significant trade-off between inflation and unemployment. Therefore economists have the best interest to identify their relationship; whether there is a short run tradeoff between the rate of inflation and unemployment, (McConnell, 16th ed). In this regard, it has also been seen in many studies that there is a short-run tradeoff between inflation and unemployment in different countries in different time periods. Though, the rate of

low inflation and low unemployment are major economic goals. But it is not possible to achieve both economic goals (low inflation and low unemployment) simultaneously. Inflation is the function of monetary policy while unemployment is the function of fiscal policy. The aim of monetary policy is to control the level of inflation or to maintain the sustainable inflation in the economy by sacrificing employment. In contrast, the goal of fiscal policy is to make low unemployment in the economy at cost of inflation. Therefore, coordination among the policies is very important in order to maintain an optimal level of tradeoff between inflation and unemployment. At present Indian economy is undergoing shocks of high inflation and unemployment. The purpose of this paper is to revisit the trade-off between inflation and unemployment. This paper established an empirical underpinning for extended Philips curve for the various decadal periods.

This paper is organized as follows- section one discusses the concept of Philips curve and review of the earlier studies. Section two develops the framework for the conventional and extended Philips curve. Section three empirically test the existence of Philips curve and interpret the result for the Indian economy. Section four is the conclusion and suggestions are also put forth for the effective formulation of the economic policies in India.

Section I

2. Review of the Earlier Studies

The relation between unemployment and inflation can be examined by Philips curve. Philips curve is named after A.H.W. Philip (1958). The model relates inverse relationship between wages and unemployment. His study was based on two-time series using UK annual data for the period 1861-1957. He conjectured a hyperbolic growth function between growth rate of wages and unemployment.

Philips work was elaborated by Lipsey(1960) by introducing the reciprocal function of unemployment and extensive statistical analysis like cost of living, effects of autocorrelation to bring Philips model closer to standard statistical methods. Klien and Ball's (1959) studied the price and wage relationship using Limited Information Maximum Likelihood (LIML) method. Thereafter, influential studies are also carried out by Dicks, Mircave, and Dow (1959), Sargan (1964).

A new wave of interest in modeling Phillips Curve emerged around the turn of 1970 by R.E. Lucas. Lucas along with Rapping extended the inverse Philips curve by introducing output-inflation tradeoff and alternative forms of the price expectations (1969b) and found a significant relationship between output and inflation, suggesting output gap as close to unemployment and economically comparable with original Philips curve. Lucas work on modeling the output-

inflation tradeoff is further extended by macroeconomist T.Sargent (1973) by introducing a natural rate of unemployment as a proxy for output gap. Thereafter, Barro (1977, 78), Immakunas Tsurumi (1985) and Learner (1986) found significant unemployment and output relationship. N. Gregory Mankiw said, the short-run tradeoff between inflation and unemployment still exist in economies because all economists are agreed that monetary policy affects unemployment in short run and also estimates the inflation in long run. Karanassou and Sala (2010) they argued that there is a tradeoff between inflation and unemployment in long run because of money and productivity growth which leads to decrease in unemployment, while supply shocks like oil prices, which leads to increase in unemployment.

Studies for India that address the tradeoff includes Rangarajan (1983), who initially examined the price and output changes in the industrial sector and concluded that the relationship between inflation and unemployment was positive. Rangarajan and Arif (1990) estimated an econometric model to investigate the interrelations between money, output, and prices. They evaluated the tradeoff between output and prices and showed that government capital expenditure increases output but leads to higher prices. The tradeoff between output and inflation worsens sharply as the resource gap is met by borrowings from the Reserve Bank.

Dholakia (1990) examined the tradeoff between inflation and output within the Phillips curve framework by estimating the short-run aggregate supply curve for the period 1950-51 to 1984-85. He found no substantial tradeoff in the economy in the short run, implying almost rigid wages and prices in the short-run as in the Keynesian case. Kaliranjan (2005) empirically explored the inflation - growth nexus to estimate the threshold inflation rate for India. Like earlier studies, they did not find any serious tradeoff between inflation and growth in India. On the contrary, they found that an increase in inflation from any level would have a negative effect on growth.

Paul (2009) attempting to find the Phillips curve argued that earlier studies could not get a regular Phillips curve in India because they did not adjust for exogenous factors like droughts, oil shocks, and liberalization policy. He demonstrated that a short-run Phillips curve did exist for India in the industrial sector once these factors were included as dummies in the equation. Patra and Ray (2010) empirically explored the relationship between inflationary expectations and the monetary policy. They estimated a Phillips curve taking into account fiscal and monetary policy stance, marginal costs and supply shocks. Their finding is consistent with the adaptive expectation hypothesis that high inflation seeps into anticipation of future inflation and tends to linger. This paper is an attempt to revisit the unemployment-inflation relationship for the Indian economy for the

period 1950-2014-15, by dividing a time period into various samples, along with the formulation of inflationary expectation using adaptive expectation method.

Section II

3. Empirical Framework

Conventionally, the simple Phillips curve represents the tradeoff between inflation and unemployment in an economy can be expressed as-

$$g_w = -\beta (u-u^*) \qquad \text{----------(1)}$$

where β measures the responsiveness of wages to unemployment. g_w is the wage inflation, u is actual rate of unemployment, u* is the natural rate of unemployment.

The equation states that wages are falling when the actual unemployment rate (u) exceeds the natural rate (u*) that is, when (u>u*), and rising when unemployment is below the natural rate. We can rewrite equation (1), the original wage-inflation Philip curve, to show that it is the excess of wage inflation over expected inflation as follows-

$$g_w - \pi^e = -\beta (u-u^*) \qquad \text{----------(2)}$$

where π^e is the level of expected price inflation.

Maintaining the assumption of constant real wage, wage inflation (g_w) will be equal to actual inflation (π_t). In order to capture the effect of speed of recovery due to adverse supply shocks, Philips curve is extended to include the term φ(ut-ut-1) as suggested by Okun. Thus the equation for the modern version of the Philips curve, the (inflation) augmented Philips curve is

$$\pi_t = \pi^e - \beta (u-u^*) + \varphi(u_t-u_{t-1}) + \varepsilon \qquad \text{----------(3)}$$

where, (π_t) is actual inflation rate, (π^e) is expected inflation rate, (u-u*) is cyclical unemployment given by the difference of unemployment rate (u) and the natural rate of unemployment (u*) and (ε) is an error term.

The parameter (β) measures the response of inflation to cyclical unemployment. The distance between (u) and (u*) is called the unemployment gap. (u_t) is the current and (u_{t-1}) is the past period's unemployment rate. The parameter (φ) measures the extent to which changing unemployment affects inflation. A larger value of (φ) signifies a greater importance of the effect of changing unemployment on the inflation rate. The parameter, thus, represents the sensitivity of wages and the rate of inflation to the rate of recovery in the system. It indicates that current inflation depends on expected inflation, unemployment gap

and the speed at which unemployment changes.

For the Indian economy, as in the case of most of the developing economies, comparable and reliable long time series data on unemployment rates do not exist. It is, therefore, necessary to convert equation (3) by using the proxy for unemployment over time. This can be possible by applying Okun's law. Okun's Law states that deviation of output from its trend rate is inversely related to deviations of unemployment from its natural rate (Okun 1983; Mankiw 2006). This is an empirical finding given the status of a 'law' to substitute unemployment over time by output function which assumes a level of output as proportional to employment. Using this relation, we can replace the second term of equation (3) for Y in place of U as follows –

$$-\beta (u-u^*) = + \alpha \frac{(Y-\bar{Y})}{\bar{Y}} \quad \text{and}$$

Further using the proportional short-run production function we can rewrite the third term of the equation (3), in terms of growth rate as follows -

$$(u_t-u_{t-1}) = - [1/q] (G_Y-G_{\bar{Y}})$$

where Y and Y-bar are output and trend level of output respectively; and α is β times the ratio of trend level of output and full employment level of output. $q=Y_F/Y_{t-1}$ (which is closely akin to the Okun's Law), and G_Y and $G_{\bar{Y}}$ are the growth rate of output and trend growth rate respectively. With this substitution, the Phillips curve in equation (3) can now be written as:

$$p_t = p^e + a \frac{(Y-\bar{Y})}{\bar{Y}} [f/q] (G_Y-G_{\bar{Y}}) \quad \text{----------(4)}$$

We now have the basic Phillips curve given by equation (2) and the extended Phillips curve given by equation (4). The equations can be estimated using price and output data.

Before we proceed, we need to address two issues pertaining to the specification of models-

The first is of inclusion or exclusion of the intercept in the equation. Laidler (1976) observes that for evaluating the hypothesis in the Phillips curve framework, the intercept would be either constrained to zero or entirely omitted. He argues that if there is no unexplained trend in prices, the intercept should be zero. This implies that Philips curve equation can be estimated by omitting the intercept thereby constraining the equation to pass through the origin.

The second issue is what Paul (2009) rose about including exogenous influences like supply shocks and policy regime change. He cites several studies in support

to argue that adverse supply shocks are amongst the most important factors in explaining fluctuations in inflation in India. He considers three shock variables namely; drought, oil shock and liberalization policy as factors contributing to the explanation of inflation in India. The dummy for drought is constructed by taking into account years of 1965, 1966, 1972, 1979, 1982, 1987, and 2002 and assigning one to each post-drought year and zero otherwise. The oil shock dummy is built on the basis of Abel and Bernanke (2008) by considering two adverse supply shocks that stand out, namely 1973-74, 1979-80 and the third one in 1990. The dummy is assigned as one for two consecutive years following the first and second oil shock and one after the third oil shock. The liberalization policy dummy is constructed by taking years of 1992-2012 as one and zero otherwise. However, Paul (2009) considers all the three variables as the intercept dummies that are contrary to Ladler's (1976) argument of omitting the intercept. Since this study considers the inclusion of shock variables, we introduce slope dummies for drought while for liberalization intercept dummies are used.

Considering these two aspects of shock variables and omitting the intercept, the equation to estimate the Philips curve is:

$$p_t = ß_1\, p^{e} + ß_2 \frac{(Y-\overline{Y})}{\overline{Y}} + ß_3 D_1 \frac{(Y-\overline{Y})}{\overline{Y}} + ß_4 D_2 + ß_5 (G_Y - G_{\overline{Y}\,?}) + e \text{ ----------(5)}$$

where D_1 is the dummy for the ith shock variable and β_3 is the corresponding correction in the slope parameter, β_2 due to ith shock variable. D_2 is the dummy used to capture the impact of liberalization. However, in order to empirically estimate equation (5) we need first to define the expected inflation (π^e).

4. Formation of Inflationary Expectations

In defining and testing the expectations hypothesis, variants of the adaptive expectations framework have been adopted. These continue to be theoretically the most accepted and convenient frameworks for integrating inflationary expectations into the Phillips curve. The methodology of using distributed lags for forming adaptive expectations initially popularized by Cagan (1956) and Nerlove (1958) and skillfully used by Turnovsky (1970, 1972) and Laidler (1976, 1977) forms the basis for our consideration.

One of the problems in formulating and testing the expectations hypothesis is that no direct price expectations data are available for most developing countries like India. Hence, testing of such hypotheses requires either consideration of lagged inflation or construction of expected inflation series based on past observed inflation rates.

Following the conventional methodology as in Laidler (1976), it is empirically more appropriate to use the adaptive expectations framework and to obtain a test

of hypothesis about expectations coming true in the long run. This would ensure a theoretically consistent and statistically tested result meaningful for interpretation. This study, therefore, postulates that expectations of inflation are based on current and past inflation rates. Thus, expected inflation (π^e) would be equal to last period's expectation of current inflation rate (π_t) plus some fraction (v) of the deviation of the current period (actual) inflation rate from the expected rate of the last period. Formally, this is given by the adaptive process:

$$p^e = p_{t-1} + v(p_t - p_{t-1})$$

$$\text{Or, } (p_t^e) = v\, p_t + (1-v)\, p_{t-1}$$

where (v) is the coefficient of adjustment of the adaptive process.

Applying the above equation to all time periods taking different values of (t) and sequential substitution gives the standard expression:

$$\pi^e = v\,\pi_t + v(1-v)\,\pi_{t-1} + v(1-v)^2\,\pi_{t-2} + v(1-v)^3\,\pi_{t-3} + v(1-v)^r\,\pi_{t-r}$$

The equation represents the expected rate of inflation as a weighted average of all past observed (or actual) inflation rates. Thus, all past values of inflation (π_t) have to be considered to estimate expected inflation (π^e) unless (v) takes extreme values of either (0) or (1). In the former case for (v) = 0, the expectations are completely inelastic or fully non-adaptive while for (v) =1 expectations are infinitely elastic or instantaneously adaptive, implying rational expectations. Thus the parameter (v) is crucial for estimation purposes since its value has an implication about the alternate hypothesis of the formation of expectations. After several iterations, the methodology developed here includes the formulation of adaptive expectation assuming v as .65, using five years lag values, and as also suggested by the finding of a study done by Dholkia (2012). This is subject to fulfilling the condition of lack of autocorrelation and value of coefficient (v) should be statistically approximately unity.

Section III

5. Empirical Findings

The extended Philips curve, as derived previously, can be empirically tested with the help of the following equation:

$$\pi_t = \beta_1 \pi^e + \beta_2 \frac{(Y-\overline{Y})}{\overline{Y}} + \beta_3 D_1 \frac{(Y-\overline{Y})}{\overline{Y}} + \beta_4 D_2 + \beta_5 (G_Y - G_{\overline{Y}}) + \varepsilon \text{ ----------(5)}$$

where π_t is actual inflation, π^e is expected inflation, $(Y-\overline{Y}) / \overline{Y}$ is output gap, $(G_Y - G_{\overline{Y}})$ is the growth gap, β's are regression parameters, $D_1$is the dummy for the shock variable and β_3 is the corresponding correction in the slope parameter, β_2

due to ith shock variable. D_2 is the dummy used to capture the impact of liberalization and (ε) is an error term. The data to be used is collected from Central Statistical Organization for the year 1950-2014-15. In order to examine the changing pattern of unemployment and inflation the whole period, of 1950-2015 is divided into five sample period based on several factors viz. 1955-1970 (in order to find the effect of drought), 1970-1980,1980-1992, (to find out the supply shock of oil). Post liberalization period is also divided into two periods. First is from 1992-2006-07, that is, before the financial crisis and second is the post-crisis period from 2007-08 to 2014-15 in order to show the effect of the financial crisis on Indian economy. The data to be used for estimation is the series of India's annual Gross Domestic Product (GDP) at factor cost from 1950-51 to 2014-15 at 2004-05 (constant) prices. The rate of annual inflation is calculated using the GDP deflator. The trend growth rate of output is calculated by Hodrick Prescott Filter Method1. GDP growth series and the deviation of actual annual growth rate from the trend growth rate is calculated accordingly. Assuming the value of v as 0.65, using five years lag values. Results of the equation (5) obtained are shown in table 1.

The result is shown in the table-1 (shown in the appendix) are standardized coefficients. It is corroborated from the above result that the coefficient of expected inflation is significant for all the years. The coefficient of expected inflation (β_1) is rising but slightly less than unity for the period of 1955-70, 1970-80 and 1981-1992. Whereas for the post-liberalization period, its coefficient value is greater than unity. Its value is 1.092 for the period of 1992-2006-07, and 1.51 for the period of 2006-07 to 2014-15. This shows that actual inflation rate is higher than expected inflation rate during the post-liberalization period. Implicitly, it signifies rising wage rate in the Indian economy during this period. While for the whole period of 1950-2014-15 its value is closer to unity statistically significant. It further suggests that people learn from the previous experiences about inflation rate so their expectations are going better with the passage of time.

The coefficient of the output gap (β_2) represents the slope of the Phillips curve. The finding shows that slope of the output gap is irregular during the period 1950-2015. It shows the tradeoff between unemployment and inflation during the period 1955-70, 1980-1992 and 2006-07 to 2014-15 while for the period 1970-80, 1992-2005 negative sign indicate no trade-off between unemployment and inflation (as mentioned earlier output gap is inversely related to unemployment). Turning towards the long run period from 1955-2015 coefficient value is positive but the value is negligible (.004) and insignificant suggesting a marginal tradeoff between unemployment and inflation for the Indian Economy. Looking towards the broader aspect, the coefficient (β_2) value is very low signifies speed of price

adjustment that is price adjust slowly and aggregate supply mechanism will return the economy to potential output relatively slowly so it is necessary to use aggregate demand policy to speed up the process. The finding of this study is sharply different from the study done by Dholkia and Sapre (2012) for the period 1950-2008 and found the subtle tradeoff between unemployment and inflation for the Indian economy.

The second finding is the statistically significant negative estimate of the coefficient of growth gap β_5. This represents the combined effect of two parameters (φ) and (q) from equations (4). Parameter (φ) represents the sensitivity of the rate of inflation to the rate of recovery (growth) of the system, whereas (q) represents the Okun's parameter reflecting the cost of unemployment in excess of the natural rate of unemployment. Thus the negative estimate of the β_5 coefficient implies that parameter (φ) is negative for the Indian economy. This suggests that a strategy for fast growth to reduce involuntary unemployment is not likely to generate inflationary pressures in India. On the contrary, slow recovery is likely to aggravate inflationary pressures in the economy. Both the fiscal and monetary authorities in India have been expressing a concern, though, without any supporting empirical evidence that rapid recovery may lead to inflationary pressures in the economy, Government of India (2011) and Reserve Bank of India (2011). Thus, their inference about the subtle tradeoff between speed of recovery and inflation from the basic Phillips curve is incorrect and is not supported by the findings of this study. Thus, in order to control high inflation, a policy-induced demand contraction is likely to result in a slower rate of recovery (growth) of the economy, which may be counter-productive for controlling inflation in India.

Finally, the negative and statistically significant coefficient for the slope dummy for the oil shock and liberalization suggests that such shocks essentially reduce the sensitivity of wages and price to the unemployment or the labor market disequilibrium in developing countries like India. Supply shocks make wages and prices more rigid and make the process of automatic adjustment towards equilibrium slower and painful in such economies. As per the result of this study, under such circumstances, any measures of demand contraction like tight fiscal and monetary policies would result in larger unemployment for longer duration and in a slower reduction in inflation. The implication of this finding is consistent with our other findings that the policy of fast (growth) recovery is the best option for the developing countries like India to solve their problems of both inflation and unemployment created by adverse supply shocks without worrying unduly about the trade-off.

The difference is highlighted by the fact that over time the economy has moved from an inward-looking and controlled regime to trade-oriented liberalized policies and market-determined prices as well as the huge financial crisis so, with

the integration to international markets, inflation is no longer driven exclusively by domestic factors and demand, but the supply side has also become responsive to market prices so it is not possible to find the regular trade-off over a period of time. As quoted by the 23rd Governor of RBI, Raghuram Rajan (2013), "emphasize will be given on low and stable expectations of inflation in the coming policies, as inflation may stem from domestic sources or from changing the value of currency, supply constrained or demand pressure."

Section IV

6. Conclusion

This paper is an attempt to revisit the unemployment-inflation relationship for the Indian economy for the period 1950-2014-15, by dividing a time period into various samples, along with the formulation of inflationary expectation using adaptive expectation method based on the coefficient value of v as .65, taking five-year lags. This is subject to fulfilling the condition of lack of autocorrelation and value of coefficient (v) should be statistically approximately unity. The study empirically estimate the Phillips curve for India, subsequently incorporate the extended part of the Phillips curve, and find that there is no regular tradeoff between inflation and unemployment in the short-run in the economy during the different time periods, it fluctuates from time to time depending on the various factor. It shows regular trade-off during the period 1955-70, 1980-1992 and 2006-07 to 2014-15 while for the period 1970-80, 1992-2005 negative sign indicate no trade-off between unemployment and inflation. Turning towards the long run period from 1955-2015 very low and insignificant positive coefficient (.004) suggest a marginal tradeoff between unemployment and inflation for the Indian Economy.

The statistically significant negative estimate of the coefficient of growth β_5 (G_Y-$G_{\bar{Y}}$) represents the combined effect of two parameters (φ) and (q) from equations (4). Parameter (φ) represents the sensitivity of the rate of inflation to the rate of recovery (growth) of the system, whereas (q) represents the Okun's parameter reflecting the cost of unemployment in excess of the natural rate of unemployment. This suggests that a strategy for fast growth to reduce involuntary unemployment is not likely to generate inflationary pressures in India. On the contrary, slow recovery is likely to aggravate inflationary pressures in the economy.

Further the rising coefficient of expected inflation suggest that people learn from the previous experience so their expectations are going better with the passage of time, so general rise in inflation up to expected level may not much affect the general public but still after liberalization, especially after post-crisis period (2008) rise in actual inflation more than expected inflation marks a high

uncertainty, so it is essential to maintain stability in the economy by controlling this running inflation.

Finally, the negative and statistically significant coefficient for the slope dummy for the oil shock and liberalization suggests that such shocks essentially reduce the sensitivity of wages and price to the unemployment or the labor market disequilibrium in developing countries like India. Supply shocks make wages and prices more rigid and make the process of automatic adjustment towards equilibrium slower and painful in such economies. As per the result of this study, under such circumstances, any measures of demand contraction like tight fiscal and monetary policies would result in larger unemployment for longer duration and in a slower reduction in inflation.

In short Philips curve or unemployment-inflation relation is not a long run relationship. It is basically a short run phenomenon. Even in the short run, the tradeoff between unemployment and inflation differs in the different time period. This relation varies significantly, depending on various exogenous factors like supply-shocks, liberalization policies, foreign sector etc. which also affect the real sector of our economy. So, while formulating policies, it is appropriate to revisit the trade-off between unemployment and inflation during the short run period by taking into consideration all these factors.

Notes:

1. Hodrick Prescott (HP) filter method to calculate the trend of the service sector. This method is widely used in macroeconomics to obtain a smooth estimate of the long-term trend component of a series. It computes the smoothed series(s) with minimum variance.

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APPENDIX

Table 1: Regression Results of the Philips Curve in India

Dependent variable: Actual Inflation

INDEP. VARIABLE	1955-70	1970- 1980	1981-92	1992-2006-07	2007-2014-15	1950-2015
Expected inflation (β_1)	.971 (9.1)	.941 (12.5)	.998 (54)	1.092 (13.41)	1.51 (7)	.987 (33)
Output Gap (β_2)	.087 (.66)	-.012 (-.144)**	.027 (1.00)	-.045 (-1.5.)	.119 (1.15)	.004 (.136)
D_2 Oil (β_3)		-.022 (-.223)	-.011 (-.490)			-.043 -1.62
D_3 Liberalization (β_4)				-.030 (-.407)	-.61 (2.2	-.021 (-.812)
Growth gap (β_5)	-.026 (.235)**	-.172 (-1.69)	-.040 (-1.69)	-.015 (-.692)**	-.027 (-.58) **	-.047 (-1.70)
R^2	.94	.97	.995	.994	.99	.97
D.W.	1.41	1.82	1.50	2.30	1.06	1.78

Computed.

**indicates level of significance five percent*

*** indicates value of significance at ten percent*

Half-baked Structural Transformations in India[1]

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Abstract

What is suggested by the theories of structural transformation, in general, has been partially applicable in the case of Indian economy both at aggregate and sectoral level? The shift in the sectoral composition of GDP in India has been analogous to other countries, however; the order of shift has been different. When it comes to employment, India is lagging far behind other countries of the world in terms of structural changes. Employment without growth in agriculture sector, growth without commensuration of employment in the service sector and sluggishness of manufacturing sector portray some downsides of the Indian structural Changes. Therefore, Indian growth pattern is tagged with "Jobless growth". Service sector's insufficiency in creating jobs while leading the economy in terms of GDP is an issue of grave concern. The manufacturing sector has strongest backward and forward linkages in general and strongly linked with service sector in the Indian economy in particular. It suggests developing an alternative model of growth where manufacturing sector growth must be underlined in the growth strategy. Procedural bottlenecks, as well as institutional reforms, need to be expedited and effective execution of "Make in India" concept may also prove fruitful in this direction.

1. Introduction

Allen Fisher, Collin Clark, Simon Kuznets, Hollis Chenery,[2] and other economists conducted studies on structural changes that occur in an economy and divided economic development into three stages based on these changes. In the first stage, an economy is agrarian meaning that it is dominated by agriculture sector both in terms of GDP and employment and followed by industrial and service sector. Industrial sector leads the economy in the second phase of development followed by the service sector and agriculture sector respectively. In the third phase of development, the economy is led by service sector followed by industrial sector and agriculture sector. Therefore, gradual and orderly shifting of economic activities (in terms of GDP as well as employment) from agriculture sector to industrial sector and then to service sector is an indication of development that economy experiences while passing through structural changes.

In this backdrop, the present paper is an attempt to see the structural changes occurred in Indian economy with special reference to employment by analyzing

1. The paper is written under the aegis of NITI Ayog Chair, Department of Economics, University of Rajasthan, Jaipur

2. Seth, Vijay K. (2006) "Economics of Services: Story of Transformation of Cinderella into Queen of Hearts", Ane Books Pvt. Ltd., India.

structural changes in terms of growth measured by changes in the sectoral composition of GDP, changes in the employment structure overtime, linkages between manufacturing sector and Service sector and by examining the possible options.

1.1 Structural changes in terms of growth

The usual method adopted by economists to understand the relative importance of various segments of an economy is to divide it into three main sectors representing the origin of GDP.

As far as the disaggregation (sectoral composition) of GDP in India is concerned, it is evident from table 1.1 that the share of primary sector has declined from 31.37 percent in 1990-91 to 13.94 percent in 2013–14. Thus, the primary sector, on which the economy was heavily dependent, is no longer as predominant as before. The share of secondary sector is almost stagnant with 25.92 percent in 1990–91 to 26.13percent in 2013–14. The most notable feature of the sectoral composition of GDP is the steady and inevitable growth of the tertiary or services sector. Unlike primary and secondary sector, service sector's share in GDP has grown from 42.71percent in 1990–91 to 59.93percent in 2013–14. The important thing to be noticed here is that economic activities are shifting from primary sector to service sector. It implies that structural changes are taking place in terms of growth in India. However, the unique feature of this change is that unlike other countries of the world, here activities have directly shifted from agriculture to services while industrial sector remained at second place throughout.

It is sufficed to say that skewed pattern of economic growth has been observed in India where the relative share of agriculture is declining, industry nearly stagnant and services rising in the GDP[3].

1.2 Structural changes in terms of employment

Structural changes in terms of employment are also taking place in Indian economy. The table 1.2 reveals that share of primary sector is continuously declining in total employment while that of the secondary and tertiary sector is rising. It is worthwhile to note here that though structural changes, in terms of employment, are taking place in India but their pace is very slow because despite a continuous decline in its share in GDP primary sector is still contributing more than half of the total employment. It shares 51.8 percent of total employment in 2009–10 which was 74 percent in 1972–73. On the other hand, the share of tertiary sector has increased from 14.6percent in 1972–73 to 26.3percent in 2009–10.

During last thirty-eight years (1972–73 to 2009–10) primary sector has experienced a decline of around 22 percentage points in its share in employment while the secondary and tertiary sector has witnessed a rise of 10 and 12 percentage points in their shares respectively. Thus, the relative share of tertiary

3 ibrarian.net/navon/paper/INTER_SECTORAL_GROWTH_LINKAGES IN _INDIA:IMPLICATIONS FOR_ POLICY AND _LIBERALIZED REFORMS.

sector has increased in employment but an absolute number of workers is still quite low.

The above analysis shows that while output generation has shifted to services, employment generation in services has lagged far behind. This fact becomes clearer by simple observation of employment elasticity for various sectors of the economy indicating employment per unit of output or in other words employment potential of the concerned sector.

A cursory glance at long-term changes in employment elasticity substantiates the fact that employment absorptive capacity of the various sectors is declining over the period. Therefore, it has been said that while the relatively high growth in India has not been 'jobless', its employment content has been low and has declined sharply since the early 1980s[4].

1.3 Manufacturing- Service linkage as a way out for unemployment

Declining growth and employment potential of agriculture are conceivable as it is a sign of an economy's movement towards development. But, the growth of manufacturing sector is important for the economy which has not been at par with services' growth but has important bearing for employment generation. Although employment elasticity of the sector has been declining still it is substantially higher than other sectors of the economy excluding constructions. Thus, the growth of this sector needs attention for two reasons: firstly, this sector includes low productivity nature type activities hence it has a huge capacity to absorb comparatively less productive labor. Since India is a labor abundant nation or to be more specific it's an unskilled labor abundant nation, therefore growth of manufacturing sector may prove fruitful for providing employment to that vast majority of the labor force.

Secondly, manufacturing sector growth creates positive impulses for service sector growth. With the expansion of manufacturing activities demand the services like trade, transportation, storage, financing, banking, insurance and other infrastructure services increases. Thus, the growth of manufacturing sector through its linkages with service sector growth is further going to generate more employment opportunities

2. Methodology and Results

The paper is based on secondary data and the technique of log linear model has been used to test the impact of manufacturing sector growth on service sector growth. The form of the model used is:

$$\text{Log GDPs} = \alpha + \beta \text{ Log GDPm.}$$

Where GDPs=Service sector GDP, GDPm= Manufacturing GDP,α= intercept term, β=estimated coefficient (value of elasticity in this case).

4. Dev, Mahendra (2014), "Expanding Productive Employment in India", IDS Bulletin September 2013

Augmented Dickey Fuller test has been applied to test the existence of unit root in the data series or in other words to check whether the data series is stationary or non-stationary. Results of the test have been shown in the appendix.

After finding the existence of unit root in the two data series i.e. GDPma and GDPs, the second differenced data series have been used in the analysis.

Empirical analysis of the impact of manufacturing sector growth on service sector growth (in the Indian context) has been attempted here and results have been shown below:

Sample (adjusted): 1991- 2013

Included observations: 23 after adjustments

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	794.5192	211.8134	3.751033	0.0012
GDPMA2	2.095990	0.575803	3.640116	0.0015

R-squared	0.386869	Mean dependent var	1390.883
Adjusted R-squared	0.357673	S.D. dependent var	803.3694
S.E. of regression	643.8631	Akaike info criterion	15.85579
Sum squared resid	8705752.	Schwarz criterion	15.95453
Log likelihood	-180.3416	Hannan-Quinn criteria.	15.88062
F-statistic	13.25045	Durbin-Watson stat	0.498802
Prob(F-statistic)	0.001531		

The estimated model shows that 1percent change in manufacturing GDP causes a 2.09 percent change in service sector GDP in the same direction. The empirical analysis reveals β=2.09 and finds it significant. This also implies that service sector GDP and manufacturing GDP are positively related and the relationship is found statistically significant at 5% level of significance.

3. Ensuring Manufacturing Growth Contributing to Employment Generation

As discussed earlier, the growth of manufacturing sector is essential for providing employment to the ever-growing workforce in the country. The idea behind the concept of 'Make in India' is also the same. It is argued that higher investment and production in the manufacturing sector will create job opportunities for increasing workforce in the country which can also become the engine of growth for the Indian economy. It is believed that once the employment generation cycle starts it will contribute to the growth.

But if we look at the condition of Indian manufacturing sector, it is not so good and struggling to survive due to various constraints such as increasing raw material

cost, ever-growing prices of industrial land, non-availability of skilled labor.

There are various doubts raised on the success of the concept of Make in India. But, Bhagwati & Panagariya (2012) argue that countries like India must address that how precisely a highly labor-abundant India can escape the path that every successful labor-abundant economy has followed to achieve economic transformation. Conceptually, in an economy with widespread poverty, labor is cheap and therefore, it is a comparative advantage in producing and exporting labor-intensive goods and should create employment opportunities and also higher wages for the masses with an associated decline in poverty. This is possible only when manufacturing sector grows.

It is right that international demand for exports is almost at the point of saturation and expecting rise looks difficult but India can increase its share in the world's merchandise which at present is less than 2 per cent.

Further, empirical evidence shows that high growth in India in the past years has been achieved largely on the strength of India's domestic savings and its domestic demand. Foreign investment and foreign demand have, at best, played a marginal role. If we make huge domestic investments in infrastructure it will also lead to more and more employment opportunities and a better quality of life.

4. Concluding Remark

India has partially followed the path of Structural changes in terms of growth or in other words Indian experience of structural changes has been unique in this regard. The reason is that like developed nations, the service sector has taken over command from agriculture sector but manufacturing sector misses out the picture. On the other hand, India is lagging far behind other nations of the world in terms of structural change in employment. Indian growth pattern cannot be bluntly termed as "jobless" because employment elasticity is positive however the employment content in growth is quite low that is a matter of grave concern. Empirical study revealed strong linkages of manufacturing sector with service sector. Therefore, proper attention must be paid to the growth of manufacturing sector that missed out in the process of structural transformation. It is like taking the route of "Development via shortage of SOC" where investment is made indirectly productive activities first and it creates demand for investment in some basic services popularly known as social overhead capital. Removal of Procedural bottlenecks, ease in land acquisition norms, proper dealing with multiple and complex labor laws, development of infrastructure services and "Make in India" concept given by prime minister may prove conducive for the growth of manufacturing sector in India.

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Appendix

Null Hypothesis: GDPS has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.067699	0.9120
Test critical values:	1% level	-4.440739	
	5% level	-3.632896	
	10% level	-3.254671	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDPS)
Method: Least Squares
Date: 08/25/15 Time: 00:36
Sample (adjusted): 1992 2013
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPS(-1)	-0.024127	0.022597	-1.067699	0.2998
D(GDPS(-1))	0.654857	0.202204	3.238599	0.0046
C	101.8402	116.1735	0.876622	0.3922
@TREND(1990)	70.22403	34.87385	2.013659	0.0592

R-squared	0.918376	Mean dependent var	1440.986
Adjusted R-squared	0.904772	S.D. dependent var	784.6327
S.E. of regression	242.1299	Akaike info criterion	13.97979
Sum squared resid	1055284.	Schwarz criterion	14.17816
Log likelihood	-149.7777	Hannan-Quinn criter.	14.02652
F-statistic	67.50793	Durbin-Watson stat	2.228124
Prob(F-statistic)	0.000000		

Null Hypothesis: GDPMA has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.938937	0.6007
Test critical values:	1% level	-4.440739	
	5% level	-3.632896	
	10% level	-3.254671	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDPMA)
Method: Least Squares
Date: 08/25/15 Time: 00:37
Sample (adjusted): 1992 2013
Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPMA(-1)	-0.138683	0.071525	-1.938937	0.0684
D(GDPMA(-1))	0.635068	0.227140	2.795930	0.0119
C	199.7628	96.78509	2.063983	0.0537
@TREND(1990)	43.38417	23.45192	1.849920	0.0808

R-squared	0.465497	Mean dependent var	299.6755
Adjusted R-squared	0.376414	S.D. dependent var	232.4039
S.E. of regression	183.5235	Akaike info criterion	13.42553
Sum squared resid	606255.9	Schwarz criterion	13.62390
Log-likelihood	-143.6808	Hannan-Quinn criteria.	13.47226
F-statistic	5.225388	Durbin-Watson stat	1.884787
Prob(F-statistic)	0.009030		

Table 1.1: Sectoral Composition of GDP in India (% Share in GDP) at constant prices (1999-00)

Year	Primary	Secondary	Tertiary
1990–91	31.37	25.92	42.71
1991–92	30.30	25.62	44.05
1992–93	30.69	25.12	44.18
1993–94	30.01	25.15	44.84
1994–95	29.53	25.84	44.63
1995–96	27.34	26.87	45.80
1996–97	27.83	26.55	45.62
1997–98	26.00	26.40	47.60
1998–99	25.91	25.77	48.32
1999–00	24.99	25.31	49.69
2000–01	23.89	25.80	50.31
2001–02	23.99	25.05	50.96
2002–03	21.43	25.82	52.75
2003–04	21.72	25.55	52.73
2004–05	20.22	26.23	53.55
2005–06	19.54	26.39	54.07
2006–07	18.51	26.69	54.80
2007–08	17.80	26.47	55.73
2008–09	16.95	25.77	57.28
2009–10	14.62	28.08	57.30
2010-11	14.59	27.92	57.48
2011-12	14.36	28.21	57.41
2012-13	13.94	27.27	58.78
2013-14	13.94	26.13	59.93

Source: National Income Statistics, CMIE.

Fig 1: Sectoral Composition of GDP in India

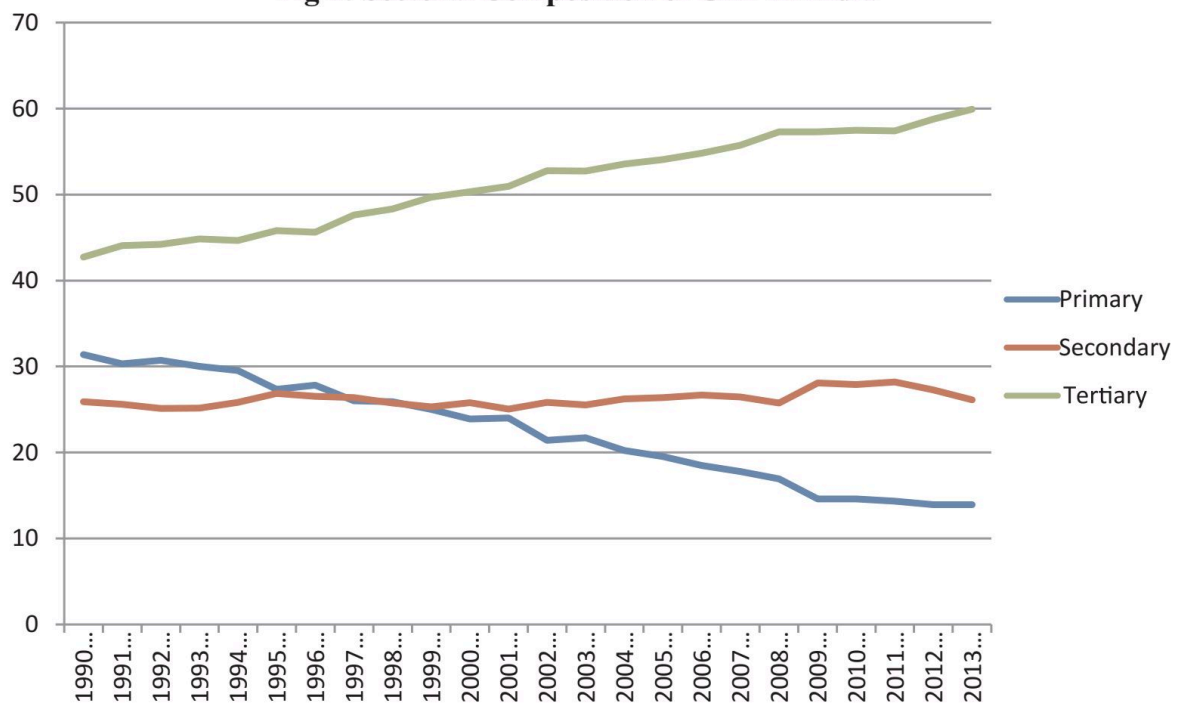

Table 1.2: Sectoral Composition of Employment in India

Year	Primary	Secondary	Tertiary
1972–73	74	11.4	14.6
1977–78	72.3	12.3	15.4
1983	68.4	13.7	17.9
1987–88	65.85	15.75	18.4
1993–94	63.67	16.21	20.12
1999–2000	61.7	15.9	22.5
2004–05	56.7	18.8	24.5
2009–10	51.8	21.9	26.3

Source: NSSO Quinquennial 27th, 32nd,38th,43rd,50th,55th,61th and 66th rounds on Employment and Unemployment

Fig 2: Sectoral Composition of Employment in India

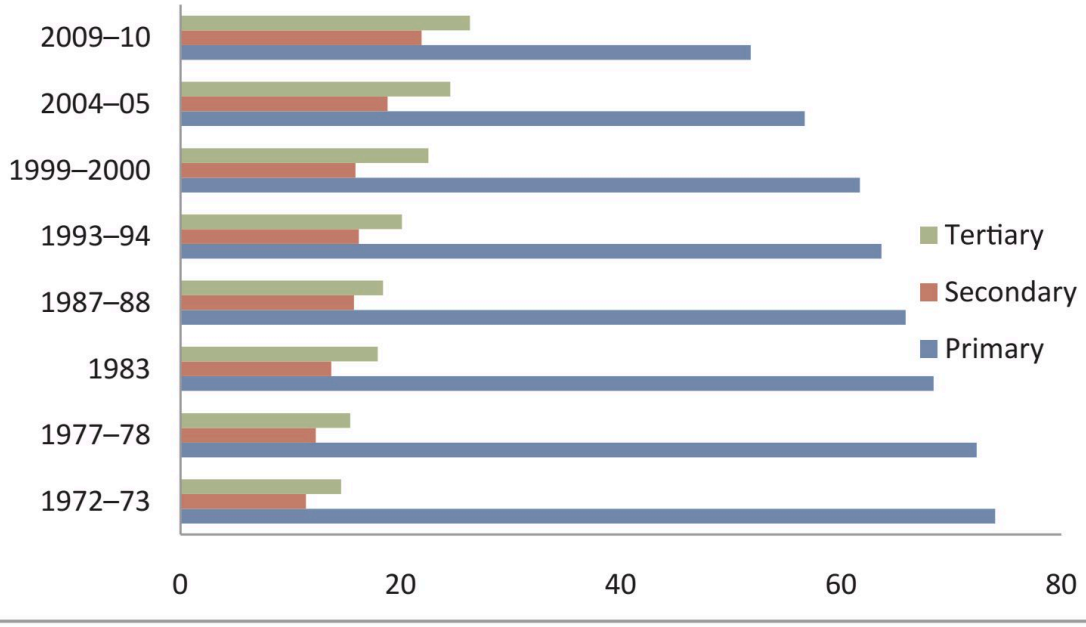

Table 1.3: Sectoral Employment Elasticities

Sector	1972-73 to 1983	1983 to 1993–94	1993–94 to 1999–00	1999–00 to 2009–10
Primary	0.46	0.49	0.26	-0.05
Manufacturing	0.78	0.41	0.47	0.25
Construction	1.44	1.16	0.94	1.06
Secondary	0.87	0.53	0.59	0.60
Service	0.77	0.57	0.43	0.30
All non-agriculture	0.81	0.55	0.48	0.41
Total	0.52	0.41	0.29	0.20

Source: Derived from Papola , T.S., and Sahu, ParthaPratim(2012), "Growth and Structure of Employment in India: Long-term and Post-reform Performance and the Emerging Challenge"

The Willingness to Educate Daughter: Evidence from Urban India

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Abstract

It has been a fact that the South Asian females are facing the largest gender disparity in the world and a society like India, this gender discrimination is layered with multiple factors such as caste, economic status of the family, religion, locality (rural and urban), etc. The micro-level analysis using National Sample Survey (NSS) Round 71(2014), the present study tried to unwrap the level of discrimination Indian women face in higher schooling system in urban India. Nonetheless, the government of India and various state governments have tried to tackle the issue of lower sex ratio in high school, the outcome of these efforts are not up to mark. The explanation for this unsuccessful story of women education can be linked to the socio-cultural and economic structure of the household. Using binary logit model (16 years and above individual's probability to pass secondary as a dependent variable), the present study addresses these issues in detail. It reveals that it is not only the infrastructural constraints such as the distance of the secondary schools, rather the attitudinal constraints such as parents' motivation to educate a girl child, occupational structure of household, etc. are more important factors to explain the gender disparity in high educational attainment. The gender gap and preference for male education is substantially more significant in rural than urban India. The study brings an important point in the light that regular consumption expenditure provides a better measurement of higher schooling. At the higher level of income, inter as well intra sector (locality) gender disparity narrow down.

1. Introduction

The public education system is a means through which government initiate the economic development, social change, reinforce national harmony and strengthen the citizenry values amongst its citizens. In the last two decades, India has made remarkable progress in expanding educational opportunities, leading to the unfolding of "schooling revolution." At the societal level, sending children to schools for a considerable number of years is increasingly becoming the topmost priority of majority of families and households.

Keeping all these notable developments in mind, the government of each nation is trying to improve the level of educational attainment (literacy rate) and introduced many policies to make education as an asset to every citizen. The governments are also spending a significant share of its GDP on education. However, despite many tireless efforts made by governments at various levels of governance, people are not able to avail the benefit of these policies. In a nutshell, the education has become an essential part of governance across all political regimes of the world, and each government is trying its best to achieve the universal education, but due to some structural challenges, it is not able to meet the targeted agenda.

Despite the tireless efforts of social reformers and educationalist, the shortcoming in Indian education system could not be overcome. A close look at the current education system reveals various issues and challenges about present education systems such as poor infrastructure, insufficient teaching staff, poorly paid teachers and unmotivated parents to teach their wards. One of many issues/challenges India suffers and more talked about is the gender disparity in the education system.

All the challenges in the existing education system in India and low concern for girl education leads to deep gender divide at each level of educational attainment. The census data since 1951 reveals (Table 1) that there was a huge gender gap between male and female literacy rate, but there is a systematic decline in the gender gap. Nonetheless, at the initial phase of nation-building in India after independence, the literacy rate among men was 24.95 percent but increased to an impressive level of 84.17 per cent. There is a significant gender difference in the schooling of children in various states of India. The situation of girl education is better in Southern and Western states of India than Northern states such as Bihar, Uttar Pradesh, Punjab, and Haryana[1]. However, after liberalization, Indian marked a positive economic shift which led to the decline in poverty in India. A change was noted in occupation pattern (from agriculture to service sector) which enhance the chance for women employment. As Jenson (2012) reveals that how increased economic opportunity for female has a positive impact on investment in girls education.

The existing gender disparity motivates one to investigate the factors responsible for the inequalities inherent in education opportunities for both boys and girls from different economic and social origin in India. India achieved universal enrolment at primary level, but it cannot be translated into higher enrollment at the secondary level, in particular for girls. A report indicated that poverty plays a significant role in the attitude to girl's education especially for people below subsistence level[2]. There is a close association between economic class of the household and girls' educational attainment. The financial conditions of the family affect the education of both gender, but girls' are more affected by the financial constraint. However, the social background such as caste, religion, locality and parents' level of education and occupation also plays an important role in female education. Nonetheless, the government increased its budgetary allocation for education to provide free education to all children without any discrimination and time to time, the government conducts (or financially facilitate institution) study to assess the existing policies and outcomes on various occasions. For motivating parents to send their girl child to schools, the government has introduced "pull" schemes such as free uniform and textbooks for girl students. It is the known fact that improvements in educational attainment of women would pave the way to eradicate gender disparities in jobs and

1. *The difference is calculated from Census of India.*
2. *The National Committee on the status of women in India (1975)*

employment opportunities (Strauss & Thomas, 1995).

Different aspects of the education of children have been exclusively studied in India which focuses on enrollment of children in primary school or upper primary school (Duraisamy, 1991; Duraisamy & Duraisamy, 1992; Basu & Jeffery, 1996; Jayachandran, 1997; Dreze & Kingdom, 2001), but there is a lack of systematic study which focuses on the probability of passing secondary school by different social-economic groups. This study tries to investigate inter-group differences of passing 10th class in the urban area. The motivation is to examine whether, and to what extent, the probability of success in secondary class is influenced by the norms or socio-economic characteristics of the community of the households.

2. Methodology

Since our dependent variable, namely secondary pass, is binary (categorical) and carry the value Y=1 (if a person is a secondary class pass) or Y=0 (if a person is not secondary class pass) so we cannot use here ordinary least square regression. Logistic regression is a well-known technique to analyze the relationship between a qualitative or categorical variable and one or more predictor variables. It is a special case of a generalized linear model which estimates the models when the outcome is a nominal variable. The probability of an outcome is modeled as:

$$P (Yi=1| x_i)= F(x_i' \beta)$$

where (β_1, β_2,… β_k)' is the k×1 unknown parameter vector. If $F(xi' \beta)= xi' \beta$ then it has a linear probability model, and the model parameter can be estimated with ordinary least square(OLS).but it suffers from two major shortcoming (a) it is not sure that predicted probability will lie between 0 and1, (b) the slope (β_k) or marginal effect will be constant irrespective of the value of x_k.

The simple logistic model can be written such as:

$$ln\ P_1\text{-}P = \log odds = logit = a+\beta_x$$

If the predictors are multiple in numbers then logistic regression will be as follows:

$$ln\ P_1\text{-}P = a+\beta_1 x_1+\beta_2 x_2+...+\beta_k x_k$$

The distribution of the binary dependent variable is binomial, and the mean of the distribution, which is the probability of getting a pass in secondary class (P, 10th class) is to be modeled as a function of the independent variables. in P_1-P=a+$\beta_1$lnmpce+$\beta_2$socialgroup+$\beta_3$householdtype+$\beta_4$muslim+β_5 secondary school distance from house hold + β_6 age code

where P in this particular case is the probability of completing 10 or more years of education for a person of 16 or more years of age.

3. Marginal Effect

Coefficients obtained with maximum likelihood estimations cannot be interpreted in the same way as in linear regressions. To facilitate interpretation of estimations, marginal effects can be calculated using the maximum likelihood results. In binary regression model, marginal the effect is the slope of the probability curve relating Xk to P(Y=1|x), holding all other predictors constant. The marginal effect for logit model will be:

$$\partial (Y=1|x_i)\partial x_k = ex'_i\beta(1+ex'_i\beta)2\ \beta_k$$

It is an informative way to summarise how a change in response is related to the variable (covariate).

4. Data and Variables

The present study is based on the unit level information from a household survey compiled by National sample survey office (NSSO) of India. This study has taken the 71st round of NSSO survey, conducted in 2014.

This survey provides both qualitative and quantitative aspects of educational services received by households. Qualitative aspects include enrolment, current attendance, drop out/discontinuation, the reason for dropout/discontinuation, literacy, education level completed, etc. Quantitative aspects include expenditure by households in tuition fees, transport costs, school uniform, etc.

The statistical analysis in the present study is divided into two cohorts – urban male and urban female. The logit model is used for regression analysis. The dependent variable for each cohort is whether an individual is a secondary pass or not after completing the age of 16 years old (age>=16). The reason for taking this cut off of age is that a child starts primary school at the age of 6 (official year of starting primary class in India), and by the time s/he would complete secondary school, s/he would reach at the age of 16 if s/he has not repeated the class. We construct a variable (egdu10) to capture this effect. Therefore, in the present study, the sample is restricted to individuals of 16 years and older.

Following some empirical studies, we include the exogenous independent variables for present analysis are household's monthly consumer expenditure, social group (caste/community), household's occupation, sex, religion, the distance of secondary school from the residence of the household and different age group as an explanatory variable. Instead of household permanent income variable, per person household expenditure (in its logarithmic function) is used as a proxy for households' economic status.

For the current analysis, individual aged above 16 years is taken into the model. For a more concrete result, age is divided into four categories –a) age group 16-20 years, b) 21-25 years, c) 26-30 years and d) 31 and above. We hypothesize that as an individual gets older the probability of completing secondary school

decreases. The probability of the youngest slot (16-20 years) in the sample is comparatively higher than other age groups.

5. Empirical Result

Success in secondary class is a binary outcome, so I use the discrete choice logit regression framework. By controlling broadly for several household features, we target to see the probability of passing secondary school in urban areas. Since my interest is in gender-based comparisons, therefore I estimated the discrete choice model of success in secondary class separately for male and female. I restrict the sample of an individual age 16 and above. The definitions of the variables are given in Table (2).The implied average marginal effect of the variables on the probability of success in secondary school is given in Table (4).

The estimated parameter of the log of per capita consumption (lnmpce) suggests that the effect of consumption expenditure is significantly higher which indicate that consumption plays a vital role to graduate in a secondary class. Tansel (1997) reveals the fact that income decline negatively affects the secondary school achievement in Ghana (1997, p.826). The positive coefficient on log per person total expenditure in the two regression equation indicates that increase in permanent income will increase the probability of higher schooling. There is a definite correlation between the income levels and the education level of the population.

At higher income level probability of high schooling is almost similar to urban male and female. This trend indicates that after a particular income level gender disparity narrow down with higher income (Figure 1).

The probability of passing matriculation in the female population above the age 16 years is lowest in SC female (38 percent). Low and backward caste men have almost the similar year of schooling compare to the high caste men but deprive caste females lag behind with high caste female. Lower caste men are ahead of lower caste women in attaining secondary education. The main reason of this can be the "reservation policy" for deprived caste in government jobs which motivate them to pursue high education whereas the traditional conservatism still bounds women of these castes. Kingdon (1998) also justify that low caste woman faces greater wage exploitation in Indian labor market.

In an urban area, cultural heterogeneity gives rise to the demand for higher schooling. Female faces a great deal of gender bias in higher schooling if they have only to be educated to a level that ensures their marriage-which is a few notches below the educational level of their prospective husbands, but this is not the case with an urban male. If men want educated wives, they also prefer to educate daughter. Lloyd et al. (2001) had described the trend in Egypt and concluded that the reflection of the social norms is one of the dominant factors to drop out for higher classes.

Being Muslim reflects a powerful negative influence on the probability of completing a secondary class in both the male and female models. Muzzammi (1994) states that muslin is more indulge in ancestral manual occupation, so they are not keen for the batter schooling of their children (1994, p.8).Kingdom (2002) finds the fact that urban Muslim female is not significantly far behind than non-Muslim female in educational attainment (2002, p.40). This suggests that may be educational discrimination against girls by Muslim parents occur at the initial stage of schooling. If parents are liberal enough to enrol them, then they do not hamper their educational aspiration. This finding is not in line with our regression result. A possible reason for this difference can be the selection of samples. Kingdon used only one district sample data while we used all India level data. So our estimates represent the overall scenario of the urban part of the country.

The probability of finishing secondary school is more likely for the regular wage-class household in India. The success ratio of the regular wage earner is 68 percent which is enough then casual labourers (42 percent). Actually, in the urban sector as well as in rural sector salaried household is performing better than all other occupation.

Casual labor faces more financial constraints as compared with another occupational group. So they neglect the education of children. Although Government is providing free education still there are hidden costs associated with the education, such as uniform, travel cost, etc. (Tilak, 1996). Poor households are unable or unwilling to send their children school due to various reasons such as, for taking help in domestic activity(for female), and Occupational activity like cattle feeding, agriculture activity(for male).Girls stay home to take care of their younger siblings when mothers go out for economic activity.

The distance of secondary school from household is used as an indirect measure of the cost of attending school, and it indicates a negative impact on the probability of secondary school success. Regarding base category (when secondary school distance is less than one kilometre), as the distance of school increases chances of success in secondary for male and female decreases. Cost consideration in the form of the short distance to the nearest school increases the probability of success in secondary classes.

Parents are more reluctant to send an adolescent girl to a coeducational school or to a school which takes significant commuting time. Caste homogeneity is considered as an important factor for the low level of schooling. If male/female belongs to a particular caste/community which receives low level of schooling, then they are reinforced to follow the the custom of the community. Generally, this phenomenon is more visible in the rural sector. When the distance is less than one kilometre, the probability of secondary success rate for urban male and female is 63 and 50 percent. However, in urban area students are not suffering

from poor infrastructure and accessibility of educational institution. Even when the secondary school distance is more than five kilometre, the probability of passing matriculation is 59 percent for urban male, and it is 48 percent for urban female.

The average probability of passing secondary class among age group 16-20 years and age group 21-25 is 75 percent for urban male and female. This indicates that young group is better able to absorb the benefits of higher schooling. Various traditional factors also affect women educational attainment in India such as early marriage and pregnancy due to early marriage. Geeta (2002) in her study has considered "age at the time of marriage" as an important variable for explaining gender disparity in high educational attainment. As per her analysis an individual who got married before the age of 17, on average, had 2.3 years less education than those who married late (2002,p.41).

6. Conclusion

Though India has a long history of quality education, it has failed to follow its heritage of enriched educational culture. Presently, it is grappling with several problems inherited in education systems such as access, equity, and quality of education. The unequal access and quality education are a matter of concern especially among girls and marginal sections of Indian society. Using the National Sample Survey Office (NSSO) data of India, the present study has looked at the determining factors influencing the probability of success in secondary class for individual aged 16 years and above. The logit model allowed us to investigate the different continuous (monthly per capita expenditure) and categorical (social group, religion, type of household occupation, distance of secondary school from household, various segment of age,) variables underlying the chance whether an individual is a secondary pass or not. The present paper analyzed the effects of these factors separately for urban male and female. People belonging to lower social strata and Muslim religion are highly deprived of having secondary education. Data suggested that the caste variable is more important for female higher schooling. In the discussion above the difference between boys and girls educational attainment is shown clearly. The underline difference is the locality of the household which widens gender gap. Cutting across all factors like caste, religion, household income, age, a distance of secondary school from the household locality plays a crucial role in passing secondary schools. There are various factors that explain this gender gap such as level of educational attainment of parents, economic status of the households, etc. For instance, the economic condition of the family is highly correlated with the attaining secondary education, and it is true for both rural and urban locality. As shown in the analysis of the per capita consumption of the household increases the probability of passing secondary education increases among both genders in urban localities. The households engaged in stable occupations provide a better

chance to their children to attain secondary education compared to other occupations. Shifting occupational structure (agriculture to service sector) will provide a more comparative advantage to women for higher schooling. Further, we analyzed our result by different age groups. Age of the individual also acts as a determinant in attaining secondary education. Younger is the age higher is the probability of passing secondary schools. Nonetheless, Muslim girls are the least benefitted. They are less successful in passing secondary school. However, the condition of the urban female is not different from rural Muslim female when we compare it with females from other religion or communities.

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Appendix

Table 1: Literary Rate in India (1951-2011)

Year	Male % of total male population	Female % of total female population	Gender Gap
1951	24.95	7.93	17.02
1971	39.45	18.69	20.76
1981	56.50	29.85	26.65
1991	64.13	39.29	24.84
2001	75.85	54.16	21.69
2011	**82.14**	**65.46**	**16.68**

Source: Census, Government of India.

Table 2: Definition of Variables Used in Completion of Secondary Education

Variables	Description
gedu10	whether an individual of age 16 & above years completed secondary class, Yes=1,No=0
lnmpce	Log of monthly per capita expenditure.
Muslim	Religion Muslim? Yes=1,No=0
Sg	Index of a social group. Takes value from 1 to 4, with 1 for Schedule Tribe,2 for Schedule Cast,3 for Other backward casts,4 for Others(General)
Hht	Index of a Household type means the main occupation of the household for rural sector and Urban sector.
Ssd	Index of secondary school?s distance from the household. Takes value from 1 to 5, with 1 representing distance less than one kilometer and five representing distance more than 5 kilometers
Age code	Index of the age of the individual. Takes value 1 to 4,with 1 represent age group 16-20,2 represent age group 21-25,3 indicate age group 26-30 and 4 represent age group 31 years and above.

Table 3: Logit Regression for Completion of Secondary Education for Age 16 and above years in Urban India

Variables	Urban Male		Urban Female	
	Coefficient	*z scores*	*Coefficient*	*z scores*
Constant	-8.385	-50.73*	-9.357	-55.54*
Lnmpce	1.269	59.75*	1.405	64.64*
Schedule caste (SC)	-0.402	-8.47*	-0.438	-8.89*
Other Backward caste (OBC)	0.122	2.9*	0.071	1.68***
General caste	0.521	12.23*	0.532	12.57*
Muslim	-0.786	-26.64*	-0.773	-24.13*
Regular Wage/Salary Earning	0.370	15.35*	0.237	9.8*
Casual Labour	-0.981	-27.87*	-0.828	-20.81*
Others	0.672	12.61*	0.150	3.45**
Distance of secondary school 1 to 2 km	-0.157	-5.88*	-0.031	-1.13
Distance of secondary school 2 to 3 km	-0.100	-2.33**	-0.146	-3.3**
Distance of secondary school 3 to5 km	-0.044	-0.57	0.031	0.41
Distance 5 km And Above	-0.273	-2.27**	-0.120	-0.93
Age21-25 years	0.000	0.00	-0.157	-3.54*
Age26-30 year	-0.542	-12.46*	-1.006	-23.58*
Age 31 year & above	-1.202	-37.97*	-2.131	-61.01*
Log likelihood	-261.73			-254.862
LR chi2(15)	136.66			158.79
Pseudo R2	0.2076			0.2378
Number of obs	49847			48077

*Note: *, **, and ***, represents significance at 1%, 5% and 10% per cent levels respectively.*

Table 4: Predicted Average Probability of Completing Secondary Education for 16 and above years of Age by Covariates (Marginal Effects)

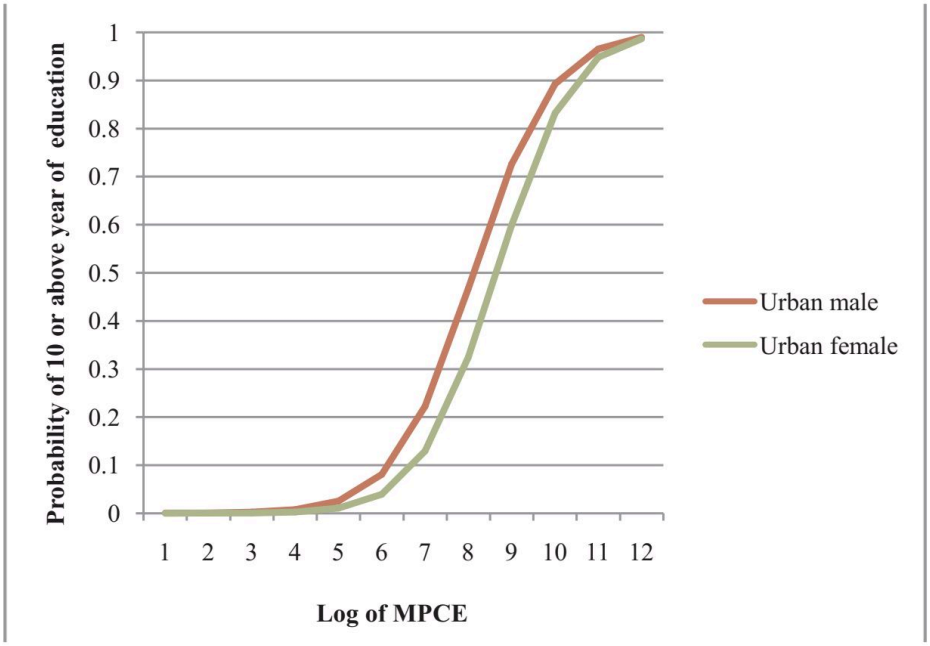
Variables	Urban	
	Male	***Female***
Schedule Tribe (ST)	0.592	0.467
Schedule Caste (SC)	0.516	0.389
Other Backward Caste (OBC)	0.614	0.480
General castes	0.684	0.564
Non-Muslim	0.650	0.523
Muslim	0.505	0.386
Self-employed in agriculture	NA	NA
Self-employed in non-a agriculture	0.619	0.499
Regular wage/salary earning	0.686	0.542
Casual labor in agriculture	NA	NA
Casual labor in non- agriculture	0.427	0.352
Others	0.737	0.526
Distance of secondary school < 1 km	0.633	0.504
Distance of secondary school 1 to 2 km	0.606	0.499
Distance of secondary school 2 to 3 km	0.616	0.478
Distance of secondary school 3 to5 km	0.626	0.510
Distance of secondary school > 5 km	0.585	0.483
Age16-20 years	0.755	0.755
Age21-25 years	0.755	0.731
Age26-30 year	0.669	0.585
Age 31 year & above	0.549	0.373

Note: NA; Not applicable, because self-employed in agriculture and casual labour in agriculture is not found in the urban sector.

Table 5: Marginal Effect for Monthly per Capita Expenditure

lnmpce	*Urban male*	*Urban female*
0	0.000164	0.0000383
1	0.000582	0.0001559
2	0.002064	0.0006349
3	0.007274	0.0025769
4	0.025092	0.010319
5	0.081003	0.0393162
6	0.222537	0.1293473
7	0.467174	0.3243472
8	0.725736	0.5986429
9	0.89241	0.8321842
10	0.965019	0.9478596
11	0.989652	0.9861741

Figure 1: Predicted Average Probability of Secondary Completion by Monthly Per Capita Income



Emerging Trends in Marketing Innovation: Rajasthan Tourism

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Abstract

The Ministry of Tourism promotes the country's various tourism products by facilitating the marketing projects through considerable funds. According to a recent report of KPMG, Travel and tourism sector's contribution to capital investment is projected to grow at 6.5 per cent per annum during 2016-2023, above the global average of five per cent. Rajasthan occupies an important place with great tourist potential with its rich historical, cultural and environmental treasures, coupled with colorful fairs and festivals and friendly people. Effectively employing innovative marketing methods will benefit all manner of travel destinations and attract a larger number of tourists to Rajasthan. Marketing programs are designed for changing lifestyle, rising income level, diverse product offerings and innovative motivator financing schemes as key drivers. The use of information technology and digital tools to tourist motivation and economic considerations is the need of an hour. There is a need to create innovative marketing programs to create & establish a roadmap for inclusive and seamless tourism. The realization of the full potentials of Rajasthan tourism depends on pursuing adequate public policies and marketing strategies. Several of such policies and strategies were suggested in this paper with the help secondary data. It is expected that this research paper would help in better understanding of the emerging trends in the tourism sector of Rajasthan. It would help in exploring the marketing potential of the state as a tourist destination. Paper also suggests the requirements for better implementation of the Government's tourism policies. Paper is an attempt to find that how the promotional and branding strategies can make a difference to boost the Rajasthan tourism sector.

1. Introduction

A decade back, no one has ever imagined that tourism which is defined as travel for recreational or leisure purposes could play a vital contribution to our country's economy. The contribution of the Tourism sector to the Country's Gross Domestic Product (GDP) and employment is significant enough to treat this sector in an important category of services exports globally. Not only the increase of foreign tourist arrivals in the country but even the greater number of Indians preferring the domestic destinations. Moreover, the younger population of Indian demographic profile is leading to the increased expenditure of these services. The total tourist visits in India have been growing at a steady rate of about 16 per cent over the past five years. While the sector supported 25 million direct and 40 million total jobs in 2012, these have been forecasted to increase at a growth rate of 2.1 per cent by 2023. (Source: KPMG). Among the several industries, drivers are the increase in individual state investments towards tourism along with improvement in the

infrastructure of rail, road, and airport.

Besides the contribution of effective means of earning foreign exchange, and providing tremendous employment opportunities, tourism sector also boost to support protection, preservation and conservation of natural and cultural heritage, improvement in health and hygiene conditions, helping in activation of latent entrepreneurship, motivating re-discovery and revival of lost traditions of art and craft, and acting as a catalyst in the growth of all sectors of economy, and thus proving to an agent to holistic development for the destinations. With the greater increased potential for tourism not only the government initiatives along with increasing, disposable income act as significant drivers but also the innovative marketing initiatives combined with tourism concepts are playing a pivotal role. Gone are the days where traditionally marketing use to concentrate on increasing visitation and treat tourism like any other commodity. The new innovative marketing strategies are trying to keep a balance of profitability of sector with tourists delight and satisfaction. Instead of diagnosing on traditional 4 P's(product, price, place, and promotion) of commodity marketing, the efforts are being focused on other 3 P's(People, Physical evidence, and Process) of service marketing. The sector is full enormous opportunities to grow but has to deal with key issues like training and skill development, safety and security of tourists, healthcare, and infrastructure.

2. Review of Literature

Macintosh and Goeldner (1986) have defined tourism is "the sum of the phenomena and relationships arising from the interaction of tourists, business suppliers, host governments and host communities in the process of attracting and hosting these tourists and other visitors." According to *Vellas* (2002), tourism is a complex economic activity which has multiple linkages to a wide range of other economic sectors and activities, thus having a positive multiplier effect and a potential to act as a catalyst for economic development. Tourism is viewed increasingly as an essential sector to local, regional and national reconstruction and development for economies at various scales *(Visser and Ferreira, 2011)*. A tourist destination is an amalgam of tourist products, services and public goods consumed under the same brand name, thus offering the consumer an integrated experience *(Buhalis, 2000; Leiper, 1995)*. Various authors have tried to explore the potential of tourism by studying the types of tourists so that marketing strategies can be targeted accordingly. *Sarigöllü and Huang (2005)* in their study segmented visitors on benefits sought by them in a tourist place. Majority represented tourists that fully explore a destination looking for a variety of benefits including outdoor adventure, ecotourism, general sight-seeing, performing arts and events, as well as fun and sun activities. The decision drivers such as accommodation provision, infrastructure, service, safety, and cost considerations are given important ratings for a tourist destination *(Gunn, 1994)*.

For marketing a destination to be targeted as favorite tourist spot not only as an active demand but also of the potential markets they can attract. It can then develop a product portfolio, which will enable the optimization of benefits and adapt their marketing mix to their target markets (McKercher, 1995, Tribe, 1997). The challenge for marketing strategist is, therefore, to provide leadership in the development of innovative products and create local partnerships for the delivery of seamless experiences. These partnerships should bring together both private and public sector and should ensure that the long-term competitiveness of the tourism product prevails all decision-making processes (Buhalis and Cooper, 1998). As per the Tourism Policy of Rajasthan 2010, the world famous "golden triangle" comprising of Delhi-Agra-Jaipur has put Jaipur on the world tourism map. 60% of international tourists visiting India visit these places. The report also says that every rupee spent by a tourist in the State changes hands thirteen times and every hotel room generate direct employment to three persons and indirectly to eight persons. According to a pilot survey conducted by ACNielsen ORG-MARG for Ministry of Tourism, Government of India in 2012-13, the highest number of tourists coming to India comes to Rajasthan. As far as the marketing potential of Rajasthan as a tourist state. Sharma (2013) studied the satisfaction level of domestic as well as foreign tourists in Rajasthan as part of SWOT analysis of the state. Shukla (2010) has also done an exploratory study aiming at initiatives for tourism promotion and attempts to answer about the promotional effort undertaken by state supply driven or customer-centric for Rajasthan. The thrust of this paper reflects this current paradigm of tourism development in its analysis and strategy recommendations for the marketing of tourism in Rajasthan.

3. Objectives of the Study

The present study aims:-

- To understand the emerging trends in the tourism sector of Rajasthan
- To study the marketing strategies boosting the marketing potential of the state as a tourist destination
- To suggest the innovation in marketing strategies implementation for Government tourist policies along with the private tourism-related business

4. Methodology

The prepared paper is a descriptive study of nature. The secondary data and information have been analyzed for preparing the paper extensively. The secondary information has been collected from different scholars and researchers published books, articles published in different journals, periodicals, conference paper, working paper, and websites.

5. Rajasthan Tourism and Marketing

Rajasthan is a leading tourism State in the country. Rajasthan contributes about 11.2 per cent and 3.3 per cent share in India's foreign and domestic tourist arrivals respectively. The tangible and intangible tourism products of the State along with its heritage, traditions, and culture are special attractions for both, domestic and foreign tourists and offers immense potential for growth of the tourism industry. In the thrust to take the maximum benefits of this potential, attracting a large number of tourists to the state to contribute maximum in the economy, there is always an urge to promote tourism. This can be done only by exposing the culture and traditions of state and making potential tourists familiar with the attractions by creating a sense of awareness among them. It can be done by aggressive marketing of the state and by applying marketing principles and well-planned strategies.

Marketing is the process of planning and executes and the promotion of the product of achieving the desired goal and objective in terms of profit and brand success. For a state, this product is tourism named as Destination. Median (1984) suggested that in product mix has three key marketing components, a. attractions of the destinations (location and the image of the destination, main events and the natural features of the site), b. facilities (basic facilities, food, shelter, and hygiene) and c. accessibility (good mode of transports and communications). So a well planned and innovative marketing strategy must satisfy three components.

6. Marketing Innovation of Rajasthan Tourism

The state's lack of tourism marketing over the last quarter of a century as compared to its neighboring states, has resulted in a sharp dip in the number of international tourists (its share has fallen from 33 per cent of international travelers to 20 per cent), as well as domestic tourists (the state gets half of Madhya Pradesh's 63 million domestic tourists). This is missed opportunity in terms of attracting international tourists, but for economic growth as well, can be trapped by introducing innovations are in Rajasthan tourism marketing which is as follows:-

- *Expansion of Tourism Unit and activities*- Not only a Govt. undertaking tourist hotel but even the budget hotels, heritage hotels, resorts, golf courses, adventure sports, etc are included in the definition of tourist unit.This is expected to increase the investment in the state too.
- Shifting from only heritage tourism to new innovation in the type of tourism like Adventure tourism, spiritual, geo, cultural, wildlife, eco, desert, and MCE (Meeting, conferences, and exhibitions).
- *Shopping tourism* - It may be the rural village or urban city of this Indian state, all have something unique and exclusive on display for its shoppers. Some of

the main highlighted cities of Rajasthan shopping include Jaipur, Bikaner, Jaisalmer, Jodhpur, Udaipur, Pushkar, Kota, Shekhawati and Barmer. which are considered a shopper's paradise. Considering the motive of tourist as shopping and also attracting the repeat customers, Great Indian Travel Bazaar (GITB) is an initiative of State's tourism ministry and FICCI.

- *Agri- tourism* is started with the innovative concept of involving tourists in the stay, can taste local farm produce and enhance their knowledge about farming along with relaxing and enjoying. This initiative helps in developing local produce thus strengthen the brand and identity of agri-tourism. For instance, date palm based agri-tourism developed on Jaisalmer-Barmer-Jodhpur-Bikaner (Desert Circuit) with high existing tourist footfall. The marketing efforts done in Mega Food Park at Roopnagar in Ajmer has staying facilities with options of vesting to organic farms learning about different agricultural practices and production.
- *Geo Tourism* is becoming a new trend with intentions to conserve the nature's products along with giving another reason to the tourists to visit and admire the distinctiveness of the spot and enlighten them with a rare natural phenomenon. For instance, Mehrangarh Fort in Jodhpur established on 750 million-year-old volcanic rocks which made a welded tuff of the emanations that spurted out from a volcano which were carried by air and ultimately settled here. Geologists at Jainarayan Vyas University, Jodhpur in association with Mehrangarh Museum Trust, Jodhpur, and Geology Alumni Association have joined hands with each other to create selfie zones for the tourist visiting it. These selfie zones will not only fulfill the desire of tourist to have a memorabilia of their visit but impart scientific information about these rocks. This is the part of conservation drive launched by these organizations wherein along with promoting Geo-tourism, the visiting tourists will be discouraged to deface the rocks through etches or coloring to maintain the beauty and uniqueness of the rocks.
- *Boutique Hotels*- Rise of boutique hotels, privately run small hotels, arty hotels with just a few rooms are attracting foreign tourists at all levels and especially those with deeper pockets. They are successful in presenting an opportunity for tourists to be more engaged with their surroundings while still having a certain level of comfort. For instance, boutique set-ups like Chandelao Garh and Deogarh, both representing authentic, intriguing, safe and relatively accessible offbeat destinations, mostly appealing to Europeans.
- *The increase of new destination for tourists* - Lesser-known districts like Pali is now hitting the international visitor's radar, boosted by their central locations and proximity to improved airports and, in the case of the above, national parks and safari options.

- *Home stays concept to promote rural tourism* - Variety in the kinds of home stays is bringing innovations to encourage rural tourism. The farm home stays introduced horse safaris. Royal home stays are blended with royal heritage welcome by royal families like Mewar family of Udaipur. Tourists stay with a rural family and experience their culture. This allows them to get to know the culture of the state. Hence, depending on guests' interests, there are three types of home stays to choose from.
- *Innovative activity based Rural Tourism package* - Range of activities included in the packages offered to tourist visiting the rural Rajasthan are leopard spotting, horse riding, spending time with the villagers and local tribes, exploring markets and forts, visiting local craftsmen and learning their arts, and evening cultural performances.
- *Tie-ups with the private sector to boost tourism* - Reinvigoration of our world famous festivals through PPP model has been done. The Pushkar Fair, Desert Festival, and Kumbalgarh Festival. New events like the Bhakti Music Festival, Coke Studio, International Photo Fest and International Music Festival have also been added to the annual calendar.
- *Pricing strategies* are designed to match the demand both in peak and off tourist seasons. Tourism packages remodeling is done to ensure value for the money, long-run investments, and product positioning. The marketing operations including planning the type of tours according to type of need and customized offerings. Rajasthan state has come up with tour packages like budget tours, heritage tours, honeymoon tours, luxury trains tour, pilgrimage tours, adventure and group tours, and golden triangle tours.
- *Innovative segmenting* the tour packages according to the duration of stay, the timing of visit (summer /winter), days of the week (weekdays off / weekend gateways). Even city wise tour packages are segmented on the basis of duration effective use of the tourist stay according to convenience.
- Marketing mix's another P stands for a place which is distribution strategy for tourism products. The reach of tourists is eased by the aggressive involvement of innovations brought by internet in payment mechanism. This includes online booking facilities at the tourism-related point of sale, shopping joints, provision of foreign currency and insurance, ticketing, liaisoning with travel agents for local sightseeing and tour operators or travel companies like Thomas Cook, Cox & Kings, SOTC, etc to cater to the need of tourist.
- Promotion strategies are emerging as a main focal point of marketing. All the dimensions of tourism promotion like publicity programs (regular publicity stories and photographs for the newspapers, travel editors, contact with magazines on stories etc. advertising is a part of publicity, exhibitions), role and conduct of tourist guides and operation process of tourist firms are

directing towards maximizing the duration of stay with frequency of visit. . As the product, in tourism is intangible, well planned and implemented promotion strategies helps in projecting the positive image of the state. The tourist attraction, which is expensive for the customer are tangibilised keeping in mind the comfortable seats while traveling, layout, and design of the resort, natural service scope, etc. As part of the physical evidence, the signposts that indicate directions, route maps, information regarding rules and regulations of the tourist spot and the sign regarding the public utilities like toilets, telephone booth also included in promotion strategies.

- *Change of Positioning statement* - The State which was visited with its positioning tagline 'Padhoro Mhare Desh" is expected to spend over 100 crores on its new aggressive marketing campaign "Jaane Age Kya Dikh Jaye", which presents the state with a new logo, new brand identity, and a new experience calendar. The campaign is being developed by Ogilvy advertising agency to feature films on a simple idea to make Rajasthan look different from the eyes of different travelers. The intention is to change the perception of the tourist visiting the state. The campaign also includes a new website and an advertisement Print, TV and Outdoor spots which are aimed at attracting both the seasoned traveler and the youth to explore Rajasthan in a whole new way.

- Initiatives of Department of tourism to market Brand Rajasthan-
  - ✓ Organisation of various fairs and festivals throughout the year.(Gangaur, Mewar, Elephant, Ajmer Sharif, Teej, camel safari etc
  - ✓ Consideration with new Aviation policy which exercises the 'interconnectivity' clause amongst the main tourism-oriented cities like Jaipur, Jaisalmer, Jodhpur, and Kota.
  - ✓ Inter-state - Regional circuit tourism implies two or more states come together as a region and reap the benefits.For instance RTDC with Kerala for joint marketing and publicity of each other tourism products.
  - ✓ Adopt a monument scheme allows corporates, NGO, non-resident Rajasthanis to sponsor for the conservation works of fragile monuments.
  - ✓ Tie up with service providers -RTDC with Indian Railways, Indian Oil Corporation
  - ✓ The exemption in luxury, sales, entertainment taxes, registration and stamp duties.
  - ✓ Renovation of old monuments, introducing light and sound show, night viewing of monuments etc.

7. Recommendations

Marketing programs can be designed with an intention to increase the desire and intention to travel. All the marketing programs designed and formulated must ensure that Rajasthan is perceived as an attractive, unique and relevant destination in the digital channels that consumers use to seek information and gain inspiration. It should target customers by showing a distinct digital presence on Rajasthan and in other important digital channels. Market segmentation strategies can be evaluated by maintaining a web-based toolbox to enable development of profitable products and services aimed at the leisure market, the business travel segment and the local market throughout the country. There is need to provide courses and competence that increases the level of professionalism and profitability within the travel industry. State government can work on tourism policy to increase sales opportunity for related commercial tourism partners. Moreover, state government can continue to sign collaborative development MOU with other northern states. Research and development can also be used as a competitive advantage for the travel industry's ability to innovate and create value.

8. Conclusion

Rajasthan state continues to face challenges that impede its growth as a tourist' s destination. But innovative marketing programs and activities will actively contribute to a sustainable travel industry that balances the preservation of nature, culture, local society, food traditions and the environment whilst strengthening social values and financial viability. From the tourist's perspective, the concepts should be cohesive both physically and digitally and should create a link between individual products, experiences, and destinations, making Rajasthan more interesting both before and during their visit. Although Rajasthan witnessed a decline in their positions as preferred tourist destinations. While an increase in funds allocated towards tourism sector in these states is required, effective implementation of the funds may require careful assessment of the impact of marketing and promotion activities in the state. Other areas requiring consideration are improvements in overall state infrastructure.

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Role of Dairy Industry in Employment

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Abstract

Dairying has assumed greater importance in India due to its contribution to the rural poor by providing an opportunity to uplift then by generating additional income through it. The direct contribution of dairying to the rural sector through additional income and employment to the producer is well recognized. In the north – western parts of the state livestock rearing and trading is the main occupation and principal source of livelihood which provide stability in income rural areas particularly in drought-prone state, where the best species of well defined indigenous breeds of cattle high milk yielding are dominating and most suitable in arid and deserted severe climate conditions.

Live Stock Sector Tops in rural employment with 4.5 percent growth against 1.75 for all other sectors and 1.1 for Agriculture. This sector has also the highest potential for rural self-employment generation at the lowest possible investment per unit.

1. Introduction

Dairying is a major source of income for rural masses in the desert and semi-desert regions, where the uncertainty of rainfall, scarcity of fodder and grazing lands, low production of cereals, lack of infrastructure, technical education. Basically, dairy cooperatives have the provision of development of livestock and enhancement of milk. At large scale women, milk societies have emerged and they have been provided loan facilities from banks to purchase high yielding milch cattle.

Further, the number of unemployed and underemployed is very large in the rural sector. They are primarily landless agricultural workers and marginal farmers. In order to meet the challenge of employing them gainfully in the rural occupations to supplement their incomes and checking their migration to urban areas, the development of subsidiary activities such as dairy farming, poultry breeding, beekeeping, fish culture etc has been indispensable.

Dairy cooperatives have provided the farmers, a steady source of income, enhancing their earning and enabling them to improve their standard of living. Favorable income generation prospects in rural areas are helping to some extent, in slowing down the migration from rural to urban areas. These cooperatives have also served as effective tools for management of unemployment.

During the drought and famine period numbers of people sit idle without any employment or migrate to nearby cities and other distant places for jobs. To prevent them dairy farming seems to be a logical source of services in such conditions which can provide self-employment to the people inhabiting in the region and it can protect them from the vagaries of drought and famine.

Besides the direct employment in milk production, milk cooperatives have also generated additional employment opportunities for the rural youths who are currently working as secretaries, inseminators, fat-testers, village extension workers etc. in the primary societies. Part-time employment has also been created for the agents working at milk booths on a commission basis. About 5000 persons are engaged in the transportation of milk and balanced cattle feed. Employment opportunities in these jobs are likely to increase in a big way with the establishment of dairy plants, chilling centers and cattle feed factories, expansion of milk cooperatives and intensive work on input supply, supervision, extension, and audit. Indirect employment has also been created in the industries supplying plants, machinery, equipment, chemicals, cattle feed, frozen semen etc.

The employment at the levels, other than dairy farms, comes under spread effects of the dairy enterprise. In the near future, with the expansion of milk cooperatives, there may be a limited impact indirect employment, but employment generation through spread effects may be substantial.

2. Employment Generation Programme

Livestock and dairy farming has the capacity to more intensive use of labor as compared to agriculture due to its management needs. It has been observed that on average five hours manpower per day per household during the rainy season were utilized in dairying. Hence, at present a level of production with animals, dairy alone provides employment to ten million manpower hours per day in the desert areas of the State.

The objective of this program is to raise the income of rural women by Rs. 40-50 per day. Dairy is the most important and major sector of the agriculture to providing employment opportunities in rural areas, where there are more than two-thirds milk animals in the household, dairying is only the major source of income of the family labor. During the field study, it was observed that cattle households mostly involved in dairy activities, which prevails them substitutes of food, income, and employment around the year.

Employment Generation = Hours spent in livestock care x no. of members in dairy @ 8 hours job per person.

3. Animal Related Activities Performed by Women

- Feeding Concentrates, roughages and green fodder.
- Harvesting.
- Fodder cutting / Grass collection from fields.
- Grazing of animals.
- Manure collection/preparing cow dung cake.
- Cleaning milk vessels.
- Cleaning of animals and their shed.
- Milking and milk processing
- Cleaning of Udder
- Storing various feed stuff
- Milk Marketing

4. Employment through New White Revolution

In the deserts of Rajasthan before the beginning of oil and natural gas production and refinery installation, a new path has been paved to provide employment to the local rural people. About 5000 rural youth and women have been given professional training in various fields and activities in the dairy sector. This number of employment to youth will double within a year. Yet, the people of Barmer district became wealthy in 'Black Gold' (oil and gas), but they are not getting a job in this field as they are untrained and unskilled in professional activities. The numbers of international enterprises have come over here in research oil and gas, Cairn Ltd. And IFC (International Finance Corporation) agencies send the local rural youth and women to ICECD (Gujarat) for automobiles, mobile repairing, infrastructural and other professional training as well dairy sector. They thought that the world famous indigenous breeds of cattle of the desert area should be developed. Therefore, the local people of Barmer district have been sent for infrastructure training as testing, collecting, and processing of milk. After this training village, women and youth formed DCS and became the members of dairy cooperative society and started to work. 2751 youth of 13 villages people came under this scheme and assured of job security.

5. Employment Generation for BPL

Under this program, District Poverty Initiative Project (DPIP) is financed by the World Bank; Government of Rajasthan has selected seven districts viz. Dholpur, Tonk, Rajsamand, Churu, Baran, Jhalawar, and Dausa. The dairy development sub-sector has been given to RCDF under the contract. Under this, a total number of 2060 Common Interest Group (CIG) has been formed during the starting

period. The Objective of DPIP is mainly to build the capabilities of BPL families and to convert CIG's into Milk Cooperative Societies and to link there with the union for marketing of milk. Actively participating in dairy cooperative movement and number of Jobs created. Hence, it is one of the most important sectors which provides employment to the rural poor at grass root level.

In recent decades the dairy sector has emerged as an important source of rural employment and income in the country. Dairying at the micro level provides employment and income to more than 70 million farm families directly in India.

6. Employment in Dairy Farming Systems

Owing to their poor financial condition and poor networks of organized financial institutions, farmers more often than not approach private money lenders for credit and enter into some sort of marketing contracts for selling milk, normally to the disadvantage of farmers. On the other hand, regular milk vendors (dudhias) often provide credit at reasonable terms, an important source of financing to small farmers. Village-level extension workers (Gram sevaks), elite farmers of the village, and peer groups are the normal sources of information and modern technology for dairy farmers in the country. Kisan/Dairy melas also serve as sources of information to the farmers in selected areas

Despite fast growth in all other sectors of the economy, agriculture and animal husbandry in India continue to play a key role in providing employment to a large section of the population of the country. With the advancement of science and technology, the sector has emerged to be one of the profitable professions not only for rural masses but also for young and educated masses living in urban areas.

Now, there exist a number of career avenues within the agricultural industry, ranging from farm management to careers in related areas like horticulture, dairy farming, poultry farming, and many others. The individuals can find employment in industries related to the field.

Dairy farming is concerned with producing milk and milk products and raising and breeding of cattle. The dairy industry produces a range of milk products - milk, butter, cheese, ghee, condensed milk, powdered milk, yogurt, etc. while providing the raw material for many other industries. India, which enjoys a geographical advantage, in the international market, is the largest producer of milk and the second largest producer of milk products in the world. With these advantages in India, the possibility of finding employment is more in this sector.

Milk and Milk products occupy a very prominent place in the food sector and economy of India. Milk production in India is mostly based on grazing, oil-cakes, cattle feed, crop residues and all other agricultural by-products. Small and marginal farmers own almost 80% of the total land holdings. About two-thirds of the rural workforce of 300 million is engaged in agriculture, either as cultivators or as farm labor. Over the years, the growth of dairying as an occupation has

provided greater levels of employment to the rural workforce. Currently, dairying provides 70-80 million farm families the triple benefit of nutritive food, supplementary income, and productive employment, while setting right the seasonal imbalance in employment. The current annual growth rate in milk production is pegged between 4 and 5%. This is primarily due to the initiatives were taken by the Operation Flood Program in organizing milk producers into co-operatives; building infrastructure for milk procurement, processing and marketing; and providing financial, technical and management inputs to co-operatives to turn them into viable self-sustaining organizations.

7. Job Prospects

The two main areas of activity in the Dairy Industry include:

a) **Production,** which begins with the most important task of all, i.e. obtaining milk, as also breeding of high yielding cattle and taking care of the animals. Veterinary Scientists are usually best suited for such jobs. They are appointed as Procurement Officers and have to visit villages in order talk to farmers and influence them to sell their milk. Dairy scientists conduct experiments to determine the effects of different kinds of feeds and environmental conditions on the quantity, quality and nutritive value of milk produced. They also conduct research in areas of breeding, feeding, and management of dairy cattle.

b) **Processing** involves handling milk for distribution, its conversion into dairy products and so forth. This work normally begins after the milk has reached the plant. Here milk is converted into a variety of dairy products, such as cheese, chocolates, ice cream, butter ghee, and so on. Dairy Technologists deal with this aspect of the industry and also work to further develop improved methods in production, preservation, and utilization of milk and milk products.

Dairy farming also engages services of dairy engineers, who are responsible for the setting up and maintenance of dairy plants and related activities; and marketing personnel who handle the marketing and sales of milk and milk products. Employment opportunities exist in both government and private sectors. The National Dairy Development Board (NDDB), a multi-locational organization involved in planning, implementing, financing and supporting farmer-owned professionally agri-business enterprises is the core PSU in this field, although with almost every state aping Amul's 'cooperative' success, employment opportunities have increased manifold for both technologists as well as managers, both in production as well as marketing.

With the entry of multinational giants like Nestle, Cadburys, Britannia, Kellogg's, Heritage foods, KFC, HLL, etc. into the Indian market, employment opportunities, as well as salaries, have received a further boost. Traditional Indian market leaders like Mother Dairy, Indana, Milk food, Amul, Dalmia, Dabur,

Cadburys, Vadilal, Parag, Vijaya and Milk fed (Verka) are also modernizing and diversifying their operations and exploring non-traditional channels to boost demand. For young individuals looking at a career away from the hurly-burly of urban life, dairy farming could be one of the most attractive choices available.

Today there are more than 84,000 cooperatives in villages across the country. More than 10.5 million farmers form the membership of these cooperatives. They pour their surplus milk–that is milk in excess of their personal household needs–into their village dairy cooperative society. The milk is collected, twice a day from the societies and processed and packaged as milk or milk products by the cooperative union dairies of which there is today well over one hundred throughout the country.

Village dairy cooperative societies do not merely collect milk. They also sell cattle feed, an important input to increase the productivity of milch animals. The cooperatives also offer artificial insemination services for the cattle owned by members. In many states, veterinary first aid and emergency services are also provided.

The number of unemployed and underemployed is very large in the rural sector. They are primarily landless agricultural workers and marginal farmers. In order to meet the challenge of employing then gainfully in the rural occupations to supplement their incomes and checking their migration to urban areas, the development of subsidiary activities such as dairy farming, poultry, breeding, beekeeping, fish culture etc has become indispensable.

8. Conclusion

The study shows that the potential role of dairy farming as a tool to increase households incomes, create rural employment and increase the regional competitiveness at producing milk are still to be realized. There are much more possibilities in generation of employment and increase in income through various animals related activities performed by farm men/women and milk producers such as grazing of animals, collection, and feeding of grass and fodder and concentrates, water providing to animals, cleaning of sheds, bathing of animals, milking of animals and milk providing to milk societies and animal caring at all steps. In this operation about 90% women participation in various animals labor activities, maximum time devoted. It was observed that all family lady members employed in various livestock activities. She devoted about 4 hours daily at morning and evening. In additional dairy provides extra income to the milk producers in other various activities which carried out by them. These tasks change the scenario of the lifestyle, economic status, education which strengthening of the rural masses.

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Threat to Sustainable Development of India: A Quest for Environmental Performance and Human Development

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Abstract

Sustainable development has become the hot issue to talk around the world and almost for every country. It is a process that envisions a desirable future state for human societies in which living conditions and resource-use continue to meet human needs without undermining the existence and growth of the ecosystem. Its focus is more on economic development, social development and environmental protection for future generations. An unsustainable situation occurs when resources are used up faster than they can be replenished. Theoretically, the long-term result of environmental degradation is the inability to sustain human life.

The objective of the SDGs, born at the United Nations Conference on Sustainable Development in 2012, is to balance the three dimensions of sustainable development: environmental, social, and economic. India has ranked a low 110 out of 149 nations assessed on where they stand with regard to achieving the Sustainable Development Goals, 2015. India has been ranked at a low 141st position in Environment Performance Index Ranking in 2016 among 180 countries that places countries on how well they perform on high-priority environmental issues, whereas it is ranked 130th among 188 countries according to latest Human Development Report, 2015. So India's performance on both fronts of sustainable development, i.e. environmental performance and human development, is poor.

Considering this in view the present paper is focused to analyze the linkage between environmental performance and human development in India, the two components of sustainable development so that it could be found out that which component is more prominent and what is threatening sustainable development of the country most. It is secondary data based study which has used the Human Development Index and Environmental Performance Index (EPI) of India for the period 2002-14. The techniques of correlation, cointegration test, granger causality test and growth equations are used for the analysis.

1. Introduction

Sustainable development has become the hot issue to talk around the world and almost for every country. Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987). It is a process that envisions a desirable future state for human societies in which living conditions and resource-use continue to meet human needs without undermining the integrity, stability, and beauty of nature. Its focus is more on

economic development, social development and environmental protection for future generations. An unsustainable situation occurs when natural resources are used up faster than it can be replenished. Theoretically, the long-term result of environmental degradation is the inability to sustain human life.

The objective of the SDGs, born at the United Nations Conference on Sustainable Development in 2012, is to balance the three dimensions of sustainable development: environmental, social, and economic. India has ranked a low 110 out of 149 nations assessed on where they stand with regard to achieving the Sustainable Development Goals, 2015. India makes up 2.4 percent of the world's land while supporting 16 percent of the world's population. The compounding result is a severely unsustainable use of natural resources for several generations. Currently, India is experiencing rapid and widespread environmental degradation at alarming rates. Tremendous pressure is placed upon the country's land and natural resources to support the massive overpopulation. Mismanagement and overuse of India's once abundant forests have resulted in desertification, contamination, and soil depletion throughout the sub-continent. This has serious repercussions for the livelihoods of hundreds of millions of Indians that live off the land.

On Human Development front India is not performing much better. In Human Development Report 2015, it has been placed at 130th position among the 188 countries with 0.609 score in the medium human development category. The country continued to rank low in the HDI (Human Development Index).

Considering this in view the present paper is focused to analyze the linkage between environmental performance and human development in India, the two components of sustainable development so that it could find out that which component is more prominent and what is threatening the Sustainable development of the country most. It is secondary data based study which has used the Human Development Index and Environmental Performance Index (EPI) of India for the period 2002-14. The correlation, cointegration test, granger causality test and growth equations are used for the analysis.

2. Objectives

1. To analyze the trend of human development and environmental performance two components of sustainable development in India.
2. To analyze the causal relationship between human development and environmental performance in India to find out the most threatening factor to sustainable development in India.

3. Hypothesis

1. Human development and environmental performance have trend values equal to zero.

2. The environmental performance does not granger cause the human development in South Asia and the human development do not granger cause the environmental performance in South Asia.

4. Methodology

The present research is a secondary data based study which has used the data of Human Development Index (HDI) and Environmental Performance Index (EPI) of India for the period 2000-2014. Since both the indices are modified frequently, the year-wise comparison of their values is rather difficult. The differences in the yearwise indices occurred due to changes in base years, raw data sources, underlying differences in methodologies, changes in indicators and their weights etc.. So the indices on the same base or comparative form are a must. For this purpose the EPI index values are taken from the "Back casted EPI Scores (2002-2012)" and "EPI Scores 2014" data sources of Yale Centre for Environmental Law & Policy. HDI indices are modified and converted by chain indices method. The source of HDI is Human Development Reports of United Nations Development Programme. For missing values, linear interpolation method has been used. The techniques of Correlation, Cointegration Test, and Granger Causality test are applied.

5. Results and Discussion

5.1 Trend in Human Development in India (2002-2014)

Human Development in India is measured by Human Development Index (HDI). Human development is about expanding the richness of human life, rather than simply the richness of the economy in which human beings live. The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions.

India's HDI value for 2014 is 0.609, which put the country in the medium human development category positioning it at 130 out of 188 countries and territories. Between 2002 to 2014, India's HDI value increased from .498 to 0.609, an increase of 22.71 percent or an average annual increase of about 1.63 percent (table 1). So there is a positive trend in HDI in India and its trend value is very low but significantly different from zero as the null hypotheses are rejected.

Between 2000 and 2014, India's life expectancy at birth increased by 5.4 years, mean years of schooling increased by 1 year and expected years of schooling increased by 3.2 years. India's GNI per capita increased by about 117.96 percent between 2000 and 2014.

5.2 Trend in Environmental Performance in India (2002-2014)

The environmental sustainability is measured by Environmental Performance Index (EPI). It ranks how well countries perform on high-priority environmental issues in two broad policy areas, Environmental Health and Ecosystem Vitality. Within these two policy objectives the EPI scores country's performance in nine issue areas comprised of 20 indicators. Environmental Health measures the protection of human health from environmental harm. Ecosystem Vitality measures ecosystem protection and resource management.

The value of EPI in India was 29.63 in 2002 which increased by 31.23 in 2014 showing 5.4 per cent increase during 2002 to 2014 and 0.5 per cent increase per annum (table 1). The null hypotheses of growth equation of EPI are rejected which shows that its trend coefficient is significant. Though the EPI has positively increased during this year rate of increase is very low and even lower than the rate of increase of HDI. Out of the two components of EPI Environment Health (EH) has shown an increase of 1.1 per cent from 29.81 to 33.19 but Environment Viability (EV) increased by only 0.1 percent from 29.63 to 31.23 during this period. It is the ecosystem vitality measured by water resources, agriculture, fisheries, forest, and biodiversity is the main threat to environment development in India. This fact is also apparent from the figure1.

If both the Indices are compared on 100 point scale it is found that the value of EPI has remained lower than HDI during 2002-2014 and EPI is also increasing at a slower rate than HDI (table 1 and figure 2)

5.3 Interrelation between Human Development and Environmental Performance in India

The environment plays a crucial role in people's physical, mental and social well-being. The South Asia Environment Outlook 2014 report presents concrete evidence that food security, water security and the livelihoods of the people in South Asia are at risk due to climate change, air pollution, and other environmental threats. Thus theory and some empirical evidence explain a close linkage in environmental performance and human development. To find out the interlinkages between human development and environmental performance in India correlation, cointegration and causality relation is tested. The result shows that there is significant (at α=0.01) high positive correlation of 0.923 between EPI and HDI in India.

To analyze the long run relationship between EPI and HDI, the Cointegration Test is applied assuming that both the series are integrated of the same order. The results of the Trace test Max-eigen value test of Johansen Cointegration Test indicate no cointegration in EPI and HDI in India (table 3).

However, "no cointegration" does not have any impact on granger causality. It can also exist when series are not cointegrated. After applying Granger Causality Test

it is found that there is one-way causality in EPI and HDI in India. The null hypothesis 'HDI does not Granger Cause EPI' is rejected. Thus it is HDI which Granger cause the EPI in India.

6. Conclusion

On the basis of the above analysis, it can be concluded that India is facing low human and environmental development. The environment is performing even worse than human development. It is also explored that environmental performance and human development have high significant positive correlation and the causality test proves that human development Granger causes the environment performance so the situation becomes more severe when low human development force the environment performance to remain at a lower level which constrained the sustainable development of India. But if high human development is achieved by an increase in per capita income, educational and health development the environmental performance can be improved since the poverty, high densities of population, low per capita income and illiteracy and unplanned use of technology cause environmental degradation in India more. For the sustainable development of India, though human development and environmental performance both need to be improved, human development is more threatening since it is low and impacting the environment performance it is making the situation more harsh for India. Thus extra efforts for the human development, basically to provide quality education and health facilities, are must for the sustainable development in India.

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Appendix

Table 1: Results of Regression Analysis (Growth Equations) of HDI and EPI (2002-2014)

Index	B-Coefficient	t-value	F-value	R^2
HDI	.0163*	22.903* (.000)	524.538* (.000)	.979
EPI	.005*	7.064* (.000)	49.9* (.000)	.819

Source: Computed

Note : [1.] Figures in the parentheses show the p-value

**Value is Significant at 5 percent level of significance*

Table 2: Correlation in EPI and HDI in India (2002-14)

		EPI	HDI
EPI	Pearson Correlation	1	.923**
	Sig. (2-tailed)		.000
	N	13	13
HDI	Pearson Correlation	.923**	1
	Sig. (2-tailed)	.000	
	N	13	13

***. Correlation is significant at the 0.01 level (2-tailed).*

Table 3: Results of Johansen Cointegration Test

Date: 12/17/16 Time: 01:40
Sample (adjusted): 2004 2014
Included observations: 11 after adjustments
Trend assumption: Linear deterministic trend
Series: EPI HDI_PERCENT
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05

No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.391180	5.459984	15.49471	0.7582
At most 1	0.000130	0.001427	3.841466	0.9684

Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.391180	5.458556	14.26460	0.6832
At most 1	0.000130	0.001427	3.841466	0.9684

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 4: Results of VAR Granger Causality/Block Exogeneity Wald Tests

Sample: 2002-2014
Included observations: 12

Dependent variable: EPI

Excluded	Chi-sq	df	Prob.
HDI	6.488913	1	0.0109
All	6.488913	1	0.0109

Dependent variable: HDI

Excluded	Chi-sq	df	Prob.
EPI	0.003545	1	0.9525
All	0.003545	1	0.9525

Figure 1: India's Environmental Performance Index and Its Components

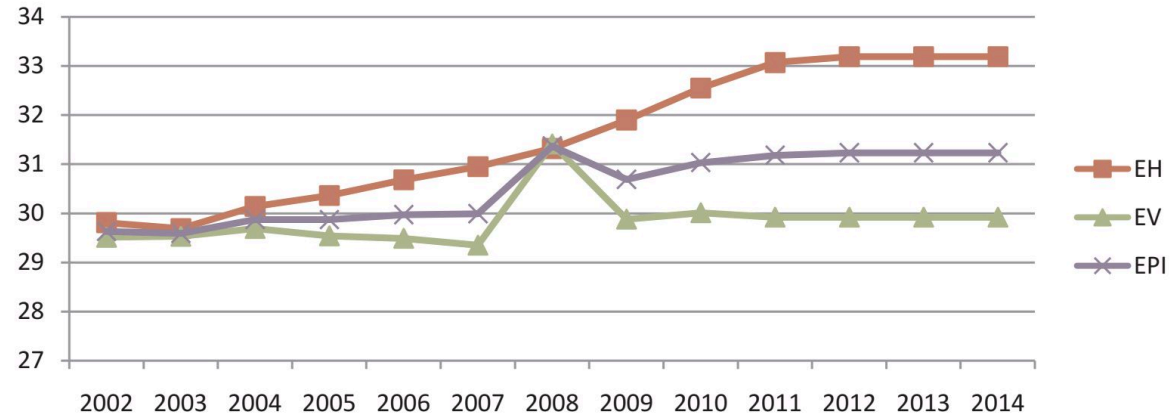
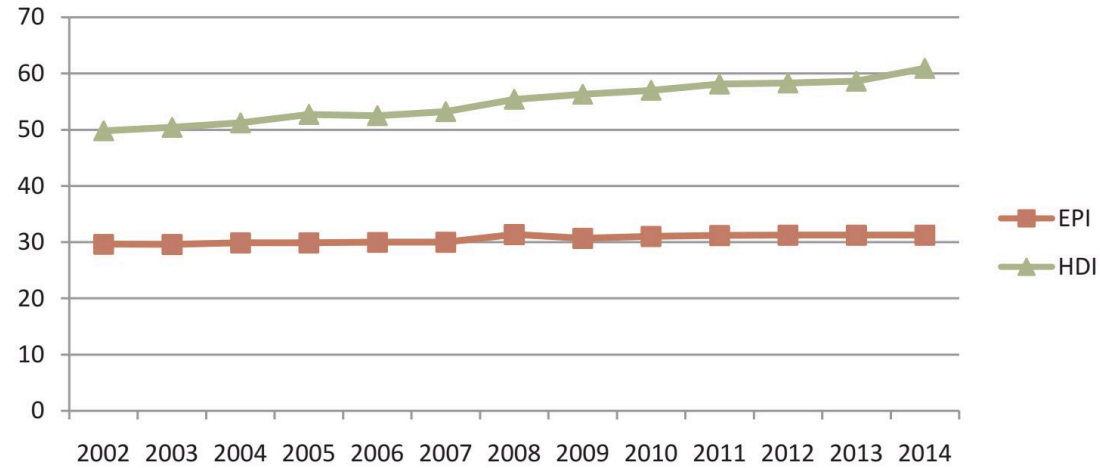


Figure 2: Trends in HDI and EPI of India



A District wise Analysis of Land Use Pattern and Land Use Changes in Rajasthan

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Abstract

Planning of land development requires in the first instance collection of available information on land-use and trends of its variation with time. Land use planning is a strategic planning exercise to assess the future potential of the agricultural sector and achieve accelerated growth through judicious management of land. In Rajasthan, because of vast arid tracts, the resources have not as yet been fully assessed and whatever information is available has not been rationally utilized to upgrade effective utilization of this resource. The present paper deals with land-use in state at different points of time and thus studies the factors affecting land use changes. The objective of the present paper is to find out the land use in different categories and the trend of variations so that the characteristics of land utilization may be analyzed for future planning. The study shows that even after a long period of planned initiatives and different policy measures adopted by a government or non-government organizations in the state, there have not been major changes in land use pattern in Rajasthan. Based on secondary data, the study analyses trends of variations in land use pattern in districts of Rajasthan and provides policy implications for future planning.

1. Introduction

For the overall development of a country like India, the growth of agriculture sector is a prerequisite. As the development of this sector not only helps the large section of the population dependent on it but also affects the other sectors through forward and backward linkages. Prosperous agriculture not only leads to its contribution to GDP growth but also helps in eradicating poverty through gainful employment generation. Accelerated agricultural growth based on increasing land and labor productivity are fundamental to poverty reduction. Past experiences have shown that speed of poverty reduction has closely followed an increase in agricultural productivity. Rajasthan is predominately an agriculture state where approx. 65% of the population is engaged in agriculture and allied activities for their livelihood. Rajasthan's record of progress in agriculture in spite of subsequent droughts over the past few years has been quite impressive. Agriculture and allied sector play an important role in State's economy. The contribution of the increased land area under agricultural production has declined over time and increases in production in the past two decades have been almost entirely due to increased productivity. The contribution of agricultural growth to overall progress has been widespread. Increased productivity has helped to feed

the poor, enhanced farm income and provided opportunities for both direct and indirect employment.

Agricultural development is a complex process of interaction between the physical input-output relations of the agricultural system. Planning of land development requires in the first instance collection of available information on land-use and trends of its variation with time. Land use planning is a strategic planning exercise to assess the future potential of the agricultural sector and achieve accelerated growth through judicious management of land. In Rajasthan, because of vast arid tracts, the resources have not as yet been fully assessed and whatever information is available has not been rationally utilized to upgrade production. The present paper deals with land-use in state at different points of time and thus studies the factors affecting land use changes. The objective of the present paper is to find out the land use in different categories and the trend of variations so that the characteristics of land utilization may be analyzed for future planning. The study shows that even after a long period of planned initiatives and different policy measures adopted by a government or non-government organizations in the state, there have not been major changes in land use pattern in Rajasthan. Based on secondary data, the study analyses trends of variations in land use pattern in districts of Rajasthan and provides policy implications for future planning.

2. Data

The study is based on secondary data primarily drawn from the 'Statistical Abstract of Rajasthan' and 'District Outlines' published annually by the Directorate of Economics and Statistics (DES), Government of Rajasthan, Jaipur. The other sources are Census reports, reports on Economic Census, and annual publications by DES on Agricultural Statistics.

3. A Brief Profile of Rajasthan

Rajasthan with total geographical area of 3.42 lakh sq km is the largest state of India constituting 10.4 per cent of total geographical area of India and with 6.85 crores population which constitute 5.67 per cent of total population of India nearly 65 percent of its population (56.5 million) is dependent on agriculture (GoI, 2011). Of the total population of Rajasthan, 75.11% was rural population. If we look at the decadal growth rate of the population, it was lower during the decade 2000s (21.44 per cent) as compared to during 1990s (28.41 per cent). The population density in the State has increased by about 22 percent, i.e. from 165 per sq.km in 2001 to 201 in 2011. The state is divided into 7 divisions, 33 districts, which are further subdivided into 297 tehsils, 44672 villages, 249 panchayat sammitees and 9,177 gram panchayats (Rajasthan at a Glance 2012).

Rajasthan, the largest state of India, is endowed with diverse soil and weather conditions comprising of several agro-climatic situations that help the state to

adopt a diversified cropping pattern. As the vast area of Rajasthan is covered by arid and dry land which imposes many challenges that are to be addressed systematically so as to facilitate a sustainable development of the sector. Moreover, the average size of land holding by all social groups in Rajasthan is higher as compared to all India average but the fertility of the land in Rajasthan is comparatively lower than the fertility of land of the same size or smaller size in other states.

Rajasthan is divided into 10 agro-climatic zones on the basis of variation in soil type, rainfall, temperature and water resources. The government has set a target to achieve a minimum of 4% agricultural growth per annum in the state agriculture policy 2013. Rajasthan has a total geographical area of 342.65 lakh ha, of which 26.75 lakh ha is under forests, 42.62 lakh ha not available for cultivation and 63.19 lakh ha is another uncultivable land (excluding fallow land). The total cultivable area is around 220.00 lakh ha. The shrinkage of the gross cropped area is evident from the fact that the highest gross cropped area was around 223.25 lakh ha during the year 1997-98.

4. Land Use Pattern in Rajasthan

The land is a natural resource which is limited in supply. For the development of a particular region and country as a whole, this resource has to be used in a best-planned manner to maximize present return from it and to increase the possibilities of getting better yield in future as well. Table 2 presents the land utilization statistics for the state of Rajasthan from 1990-91 t0 2013-14. The analysis of data clearly shows that significant changes have taken place in land utilization over a period of time in Rajasthan. The total area of Rajasthan is 342.5 lakh hectares. The area under forest was 23.5 lakh hectares which constitutes 6.9% of the total reported area in 1990-91 and which increased to 7.6% in 2000-01. The area under forest has been almost stagnant ranging between 8.0 to 8.05% and is far less than 33% recommended by National Forest Policy. The area under non-agriculture uses has increased from 14.9% in 1990-91 to 18.89% in 2013-14 which may be due to raising in population vis a vis urbanization. Increasing population and economic growth are changing patterns of land use making potentially unsustainable demands on the country's natural resources. The area under cultivable wasteland has declined from 16.3% in 1990-91 to 11.68% in 2013-14. The area under fallow land other than current fellow has been fluctuating. It increased from 5.6% in 1990-91 to 17.1% in 2000-01 but come down to 5.39%. This is due to the erratic and uncertain behavior of monsoon in the state that farmers here were unable to cultivate their land for several years.

Since the early fifties, the net area sown was expanded rapidly at first but at a diminishing rate since 1970 to reach approximately 182 lakh ha at present. Net sown area (NSA) which was 163.8 lakh hectares in 1990-91, constituting 47.8 %

of reporting area, fell down to 158.6 lakh hectares (46.3%) in 2000-01. From 2010-11 to 2013-14, the NSA in the state has been ranging between 180- 182 lakh hectares and has attained negligible growth rates. The possibilities of bringing more area under cultivation are marginal and a further addition to the cropped area is possible through intensive cultivation. This stagnancy on use of land simply shows the change in cropping patterns. In this changing scenario, the farmers are either looking for better options in non-agriculture sectors or forced to move from traditional crops to profitable crops. The change in cropping intensity has also not been very impressive.

5. Changing Land-Use and Future of Agriculture in Rajasthan

There are sharp regional differences in agriculture mainly on account of soil quality and terrain. In the districts lying east and south of Aravalli hills, the land is more fertile and agriculture is relatively prosperous. On the other hand, in the western desert districts, more than 50 percent of the land is unfit for farming.

Agricultural land use means land under net sown area, fallow land and uncultivable land excluding fallow land. The cultivated area is known as net sown area, which is also known as agriculture land. The Agriculture land use is the result of the direct application of efforts applied is related to decisions made by farmer regarding the actual use of land. These decisions are based on his appreciation of the available land resources, his responses as conditioned by the knowledge passed from generation to generation and his appreciation of demand for various agriculture commodities in the market.

Rajasthan is predominately an agriculture state where on an average Total cultivable land as a percentage of total geographical area is app. 78%. The area available for agriculture which includes current fallow land increased highly from 14,500 hectares in 1985-86 to 51,000 during 1996-97 and decreased slightly to 32,200 in 2008-09. The land under cultivable waste decreased continuously from 47,800 hectares in 1985-86 to 38,200 hectares in the year 2008-09. In per cent terms, it decreased from 4.52 to 3.61 percent of the total geographical area. This clearly showed that the area under agriculture has increased over a period of time. The area under permanent pastures decreased continuously, whereas the land under miscellaneous trees increased over the period of time. The gross cropped area was 6,95,000 hectares in 1985-86 i.e. 65.68 per cent. It showed a slight increase and reached to 7,06,500 hectares in 1996-97, i.e. 66.76 per cent and got decreased to 6,61,600 hectares in 2008-09, i.e. 62.53 per cent. This showed that the gross cropped area has decreased over the study region. The intensity of land use efficiency was 119.42 per cent in the year 2008-09 which was 117.72 per cent in the year 1985-86.The area under forest remained more or less while the land under current fallows increased over the study region. However, there were remarkable changes in the land use pattern of the net sown area over the time

period. Even though the area is sown more than once and the gross cropped area has shown a considerable change in the districts.

6. District Wise Analysis of Land Use Pattern in Rajasthan

State as a whole and District wise area under forest in Rajasthan is not only small but is also almost stagnant since 2003(shown in table 4). The concentration of forests being more in districts adjoining Aravalli, which includes districts of Alwar, Banswara, Baran, Bundi, Chittorgarh, Sirohi, Sawai Madhopur, Dungarpur, Jhalawar, Karaulli, Pratapgarh, Kota, and Udaipur have more concentration of forest area than other districts. Due to low rainfall and aridity forest area are few and almost negligible in the arid zone districts of Barmer, Bikaner, Churu, Jalore, Jaisalmer, Jodhpur, Hanumangarh, and Nagaur. There is an urgent need for more afforestation programmes to prevent the shifting of sand dunes and extension of desert area in districts of Rajasthan.

Land not available for cultivation includes area under non-agriculture uses, barren land, permanent pastures and land under miscellaneous tree crops and grasses. Jaisalmer is the district with the highest concentration of land not available for cultivation due to extensive rocky barren land and sand dunes. There is the wide scope of shifting this land under cultivation in Rajasthan. Except for the districts where irrigation has practiced the extent of fallow land is high. The density of cultivable land is also not uniform in Rajasthan.

7. Conclusion

Unplanned growth leads to regional imbalances which in turn result in several social, economic, cultural and political problems. Regional imbalances also lead to under-utilization of resources, both natural and human. In order to reduce regional disparities and adopt suitable policies for balanced regional development, there is a need to identify the developed and the under-developed regions.

There is a number of programmes started by state and central for the better utilization of land resource in Rajasthan. The Eleventh plan had given emphasis on steering the economy "Towards Faster and More Inclusive Growth". An integrated Special Area Development Plan was started which a purpose to unify various area development programmes under one single scheme to ensure rapid development of special areas. Drought Prone Areas Programme (DPAP) is the earliest area development programme launched by the Central Government in Rajasthan in 1973-74 to tackle the special problems faced by those fragile areas which are constantly affected by severe drought conditions. The central government started the Desert Development Programme (DDP) in desert areas of Rajasthan in 1977-78 under which sand dune stabilization and shelterbelt plantations were given greater weightage. Rajasthan is geographically the biggest state in India and almost 31 percent of the total area is a wasteland. Integrated Wasteland Development Programme (IWDP) has been under implementation since 1989-90 in the State.

Land use planning is a strategic planning exercise to assess the future potential of the agricultural sector and achieve accelerated growth through judicious management of land. In Rajasthan, because of vast arid tracts, the resources have not as yet been fully assessed and whatever information is available has not been rationally utilized to upgrade production. There are sharp regional differences in agriculture mainly on account of soil quality and terrain in Rajasthan. In the districts lying east and south of Aravalli hills, the land is more fertile and agriculture is relatively prosperous. On the other hand, in the western desert districts, more than 50 percent of the land is unfit for farming. As due to low rainfall and aridity forest area are few and almost negligible in the arid zone districts. There is an urgent need for more afforestation programmes to prevent the shifting of sand dunes and extension of desert area in districts of Rajasthan. More land utilization oriented programmes are needed in Rajasthan.

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Appendix

Table 1: Position of Rajasthan according to Census 2011

S.No.	*Indicators*	*Rajasthan*	*India*
1.	Geographical Area (lakh Sq. Km.)	3.42	32.87
2.	Population (in crores)	6.85	121.06
3.	Rural Population	5.15 (75.11%)	83.47(68.95)
4.	Decadal growth rate(2001-11)	21.3	17.7
5.	Density(per sq.km.)	200	382
6.	Percentage of Agricultural Laborers to total workers	16.5	30.0
7.	Percentage of Cultivators to total workers	45.6	24.6
8.	Total Reporting Area (in lakh hect.)	342.7	3059.0
9.	Total Forest Area (in lakh hect.)	27.43(8%)	700.1(22.89%)
10.	Gross Irrigated area to Gross Cropped Area(%)	36.33	44.91
11.	Net Sown Area to total reporting area (%)	52.63	46.28
12.	Net Irrigated Area to Net Area Sown (%)	39.49	44.92
13.	Average Size of Operational Holdings (hect.)	3.07	1.16
14.	Cropping Intensity	142.98	140.54

Source: Directorate of Economics and Statistics, Ministry of Agriculture
Pocket Book on Agriculture Statistics 2013
Agriculture Census Rajasthan 2011

Table 2 : Land Use Pattern in Rajasthan (Area in Lakh Hectare)

Year	*1990-91*	*2000-01*	*2009-10*	*2010-11*	*2011-12*	*2012-13*	*2013-14*
Total Reported Area	342.5(100)	342.6(100)	342.7(100)	342.7(100)	342.67(100)	342.7(100)	342.7(100)
Forest	23.5(6.9)	26.1(7.6)	27.4(8.0)	27.43(8)	27.47(8.02)	27.50(8.02)	27.58(8.05)
Area under Non-Agricultural uses	14.9(4.4)	17.4(5.1)	19.8(5.8)	18.89(5.51)	18.84(5.50)	18.64(5.44)	18.89(5.51)
Barren & Un-Culturable land	27.9(8.1)	25.7(7.5)	22.9(6.7)	23.8(6.94)	23.9(6.96)	24.11(7.04)	23.85(6.96)
Permanent Pastures and other Grazing land	19.1(5.6)	17.1(5.0)	17.0(5.0)	16.94(4.95)	16.93(4.94)	16.94(4.94)	16.94(4.94)
Land under Misc.-Tree Crops & Grooves	0.2(0.1)	0.1(0.0)	0.2(0.1)	0.2(0.06)	0.2(0.06)	0.2(0.07)	0.2(0.07)
Culturable Waste Land	55.7(16.3)	49.1(14.3)	44.7(13.1)	42.33(12.35)	41.69(12.17)	41.52(12.12)	40.01(11.68)
Fallow Land Other than Current Fellows	19.3(5.6)	24.4(17.1)	20.5(6.0)	17.36(5.04)	18.6(5.41)	20.24(5.91)	18.47(5.39)
Current Fellows	18.1(5.3)	24.2(7.0)	20.6(6.0)	12.35(3.61)	14.77(4.31)	18.7(5.45)	14.03(4.09)
Net Area Sown	163.8(47.8)	158.6(46.3)	169.7(49.5)	183.49(53.54)	180.34(52.63)	174.79(51.01)	182.68(53.31)
Aera Sown More than once	30.0(8.8)	33.7(9.8)	47.7(13.9)	76.53(22.33)	64.71(18.89)	64.75(18.90)	78.52(22.91)
Total Cropped Area	193.8(56.6)	192.3(56.1)	217.4(63.5)	260.02(75.87)	245.05(71.51)	239.54(69.90)	261.20(76.22)
Net Irrigated area*	NA	NA	58.5(34.5)	66.61(19.44)	71.22(20.38)	74.99(21.88)	76.50(22.32)
Gross irrigated area	NA	NA	73.1(33.6)	83.22(24.28)	89.03(25.98)	94.55(27.59)	98.65(28.79)
Cropping Intensity	118.3	121.2	128.1	141.71	135.88	137.04	142.98

Source: Statistical Abstract of Rajasthan, 1990-91 to 2013-14
Note: Figures in the parenthesis indicate the percentages of the total geographical area

Table 3: Land Use Pattern in Culturable lands in Rajasthan (Area in Lakh ha)

Category of Land Use	*1956-57*	*1970-71*	*1980-81*	*1990-91*	*1995-96*	*2000-01*	*2005-06*	*2010-11*	*2013-14*
i) Permanent Pastures	13.8	18.07	18.34	19.12	17.45	17.03	17.07	16.63	16.63
ii) Culturable Waste lands	73.26	61.12	64.16	55.67	51.04	49.08	45.90	42.33	40.00
iii) Fallow lands other than current Fallow	33.11	23.26	20.89	19.67	19.72	24.44	22.64	17.36	18.47
iv) Current Fallows	22.48	14.43	20.85	18.14	20.35	24.15	19.99	12.35	14.02
Net Area Sown	124.25	151.79	152.67	163.77	165.75	158.65	168.36	183.49	182.45
Total Culturable land	266.9	268.67	276.91	275.97	274.32	273.39	273.07	259.81	271.57
Total Cultivable land as Percentage of Geographical Area	77.89	78.41	80.81	80.54	80.06	79.79	79.84	75.96	79.41
Percent change		0.52	2.4	-0.27	-0.48	-0.27	0.05	-3.88	3.44

Source: 50–Years of Agricultural Statistics of Rajasthan 1956-57 to 2005-06, Directorate of Economics & Statistics, Rajasthan, Jaipur.

Table 4: District wise Analysis of Land Use Pattern in Rajasthan in 2013-14

		PERCENTAGE OF					***Cropping Intensity***	***Irrigation Intensity***
District	***AreaSq. Km.***	***Forest area to Reporting Area***	***Net Area to Reporting Area***	***Double-cropped Area to Net Area***	***Net Irrigated Area to Net Area Sown***	***Gross Irrigated Area to Gross Area Sown***		
(1)	(2)	(3)	(4)	(5)	(6)	(7)		
Ajmer	8481	6.86	54.33	64.59	30.21	21.55	143	114
Alwar	8380	10.84	64.14	72.54	90.88	56.65	169	107
Banswara	4522	20.12	50.35	51.26	47.43	31.75	148	102
Baran	6992	30.78	50.47	86.69	94.20	51.71	173	102
Barmer	28387	1.18	60.78	10.79	11.61	15.61	109	157
Bharatpur	5066	6.64	78.15	52.39	87.65	58.93	149	101
Bhilwara	10455	7.21	41.36	56.43	49.99	36.65	147	112
Bikaner	30239	3.11	55.28	19.96	22.56	32.57	116	176
Bundi	5776	24.69	45.45	72.59	91.45	60.96	176	114
Chittorgarh	7822	16.03	42.16	69.55	71.47	44.95	162	109
Churu	13835	0.48	84.73	38.35	9.91	11.40	131	144
Dausa	3432	7.67	67.18	68.85	73.94	44.64	167	103
Dholpur	3033	9.03	52.09	48.92	79.23	53.76	146	101
Dungarpur	3770	16.65	34.85	51.13	35.94	24.78	149	104
Ganganagar	10978	5.53	71.84	58.30	76.75	84.70	146	178
Hanumangarh	9656	1.93	86.42	51.07	47.67	58.30	161	124
Jaipur	11143	7.55	60.33	66.37	46.47	35.11	121	216
Jaisalmer	38401	1.18	19.46	28.62	14.87	33.30	134	113
Jalore	10640	2.24	65.37	40.84	43.73	37.18	181	105
Jhalawar	6219	20.11	53.42	91.50	87.51	48.66	160	106
Jhunjhunu	5928	6.77	70.19	70.21	55.01	34.55	113	151
Jodhpur	22850	0.37	61.05	19.67	27.00	35.22	168	102
Karauli	5524	34.23	40.06	67.69	73.72	44.13	170	105
Kota	5217	24.40	52.95	86.24	94.52	53.24	115	135
Nagaur	17718	1.06	73.29	35.98	18.99	19.58	114	108
Pali	12387	7.02	50.79	30.80	18.69	15.76	160	101
Pratpgarh	4449	29.42	44.45	66.87	63.23	38.40	149	117
Rajsamand	4655	5.80	20.30	47.79	48.23	38.54	138	102
S.Madhopur	4498	16.59	58.75	37.31	86.74	64.10	148	102
Sikar	7732	7.89	67.69	50.19	46.40	37.15	142	126
Sirohi	5136	30.02	31.99	44.43	49.80	47.27	143	154
Tonk	7194	3.79	66.71	38.22	66.85	48.76	144	102
Udaipur	11724	28.64	16.95	45.46	39.59	28.42	141	125
Rajasthan	**342239**						143	114

Source: Various Issues of Statistical Abstracts of Rajasthan, Basic Statistics of Rajasthan, Directorate of Economics and Statistics, Yojana Bhawan, Jaipur, Rajasthan

Table 4(a): District wise land use pattern in Rajasthan

(Hectare)

DISTRICT	REPORTING AREA FOR LAND UTILISATION STATISTICS	CLASSIFICATION OF REPORTING AREA					
		FOREST	NOT AVAILABLE FOR CULTIVATION			OTHER UNCULTIVATED LAND EXCLUDING FALLOW LAND	
			AREA UNDER NON-AGRI-CULTURAL USES	BARREN AND UN-CULTUR-ABLE LAND	TOTAL	PERMA-NENT PASTURES AND OTHER GRAZING LANDS	LAND UNDER MISC.TREE CROPS AND GROVES
1	2	3	4	5	6	7	8
1 AJMER	842994	57792	53794	82885	136679	78310	522
2 ALWAR	783281	84886	47841	78439	126280	23864	188
3 BANSWARA	453587	91255	11336	51762	63098	11431	132
4 BARAN	699461	215308	27646	36325	63971	33544	184
5 BARMER	2817332	33305	76142	123107	199249	203060	114
6 BHARATPUR	506731	33645	30116	21518	51634	7555	199
7 BHILWARA	1050885	75742	68544	143258	211802	120963	106
8 BIKANER	3041753	94650	271967	27605	299572	50840	3481
9 BUNDI	581938	143664	40833	47620	88453	24489	166
10 CHITTORGARH	750773	120334	54760	61112	115872	73879	591
11 CHURU	1385905	6663	65959	620	66579	37468	19
12 DAUSA	341428	26185	19788	17311	37099	25586	287
13 DHOLPUR	300913	27184	16829	57882	74711	17871	286
14 DUNGARPUR	385593	64189	22970	67641	90611	34539	1227
15 GANGANAGAR	1093282	60472	71382	1919	73301	140	6477
16 HANUMANGARH	970379	18692	57573	493	58066	4642	11
17 JAIPUR	1105519	83498	84436	57039	141475	73899	831
18 JAISALMER	3839154	45367	159065	362089	521154	103175	249
19 JALORE	1056611	23638	44712	78079	122791	47370	6
20 JHALAWAR	632235	127124	28745	33067	61812	47264	5181
21 JHUNJHUNU	591536	40045	21972	15706	37678	39353	46
22 JODHPUR	2256405	8378	77749	143862	221611	125453	148
23 KARAULI	504302	172646	24110	48867	72977	30603	196
24 KOTA	518345	126498	30193	31204	61397	13985	532
25 NAGAUR	1763821	18765	89957	55767	145724	71350	78
26 PALI	1233079	86534	59470	139191	198661	91156	415
27 PRATAPGARH	411736	121132	10916	27368	38284	22664	255
28 RAJSAMAND	452726	26239	23951	102830	126781	56201	0
29 S.MADHOPUR	497145	82495	30257	33675	63932	25996	1212
30 SIKAR	774244	61113	36569	18350	54919	40160	105
31 SIROHI	517947	155488	25647	74489	100136	33208	7
32 TONK	717958	27189	49378	26965	76343	40809	209
33 UDAIPUR	1388255	397620	154745	316752	471497	82717	572
RAJ. STATE	34267253	2757735	1889352	2384797	4274149	1693544	24032

(Hectare)

DISTRICT	CLASSIFICATION OF REPORTING AREA						TOTAL CROPPED AREA	AREA SOWN MORE THAN ONCE
	OTHER UNCULTIVATED LAND EXCLUDING FALLOW LANDS		FALLOW LANDS			NET AREA SOWN		
	CULTURABLE WASTE LAND	TOTAL	FALLOW LANDS OTHER THAN CURRENT FALLOWS	CURRENT FALLOW	TOTAL			
1	9	10	11	12	13	14	15	16
1 AJMER	66721	145553	28721	16276	44997	457973	753794	295821
2 ALWAR	7156	31208	22183	16311	38494	502413	866860	364447
3 BANSWARA	24754	36317	31130	3414	34544	228373	345438	117065
4 BARAN	13031	46759	12697	7718	20415	353008	659039	306031
5 BARMER	193992	397166	270733	204625	475358	1712254	1897017	184763
6 BHARATPUR	2635	10389	8634	6422	15056	396007	603492	207485
7 BHILWARA	115093	236162	57542	35013	92555	434624	679893	245269
8 BIKANER	612437	666758	156980	142315	299295	1681478	2017102	335624
9 BUNDI	27449	52104	23566	9647	33213	264504	456516	192012
10 CHITTORGARH	89922	164392	21227	12454	33681	316494	536622	220128
11 CHURU	12571	50058	42294	46046	88340	1174265	1624577	450312
12 DAUSA	5801	31674	9403	7695	17098	229372	387287	157915
13 DHOLPUR	7526	25683	8376	8218	16594	156741	233422	76681
14 DUNGARPUR	20754	56520	29807	10095	39902	134371	203072	68701
15 GANGANAGAR	20213	26830	70099	77140	147239	785440	1243356	457916
16 HANUMANGARH	2627	7280	22267	25442	47709	838632	1266881	428249
17 JAIPUR	41385	116115	54064	43436	97500	666931	1109593	442662
18 JAISALMER	2212211	2315635	157621	52117	209738	747260	961107	213847
19 JALORE	19611	66987	88206	64284	152490	690705	972807	282102
20 JHALAWAR	36145	88590	12520	4470	16990	337719	646729	309010
21 JHUNJHUNU	6158	45557	32031	21050	53081	415175	706653	291478
22 JODHPUR	17549	143150	271462	234306	505768	1377498	1648408	270910
23 KARAULI	11776	42575	8679	5383	14062	202042	338799	136757
24 KOTA	24488	39005	11046	5955	17001	274444	511127	236683
25 NAGAUR	12674	84102	83686	138865	222551	1292679	1757833	465154
26 PALI	47753	139324	104897	77397	182294	626266	819146	192880
27 PRATAPGARH	35991	58910	7950	2462	10412	182998	305372	122374
28 RAJSAMAND	120340	176541	27553	3698	31251	91914	135837	43923
29 S.MADHOPUR	10648	37856	11769	9002	20771	292091	401069	108978
30 SIKAR	8747	49012	42437	42681	85118	524082	787105	263023
31 SIROHI	9137	42352	28508	25753	54261	165710	239341	73631
32 TONK	43732	84750	25276	25438	50714	478962	662004	183042
33 UDAIPUR	119241	202530	63636	17699	81335	235273	342229	106956
RAJ. STATE	4000268	5717844	1847000	1402827	3249827	18267698	26119527	7851829

Covering Letter for Submission of Manuscript

The Editor,

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Subject: Submission of Manuscript in the Area of ……..

Dear Sir,

Please find my submission of manuscript titled……

……..……

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for possible publication in your journal. I hereby affirm that the contents of this manuscript are original. Furthermore it has neither been published elsewhere in any language fully or partly, nor it is under review for publication anywhere.

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FORM IV

(See Rule – 8)

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